The OIL AND GAS JOURNAL

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PRICE 50 CENTS

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JUNE 15, 1950

U-30

ONE portable drilling unit for deepest well drilling

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Moving day is a comparatively light chore when you use the U-30. That's why, in one year's time, UNIT RIG'S Big U-30 is making such a hit with drillers. The U-30, like all UNIT RIG equipment, is a compact unit, enclosed in a heavy steel plate case, and can be transported to location ON ONE TRUCK.

Investigate the U-30 for all deepest well drilling jobs. The performance of the U-30 in actual drilling operations has actually amazed even the most critical and particular drillers hardened by years of operating many types of equipment.

Get the Facts . . . Write for U-30 Bulletin

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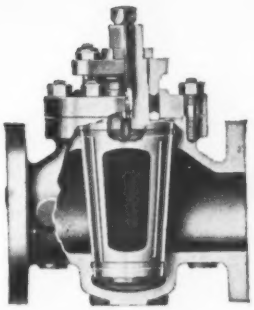
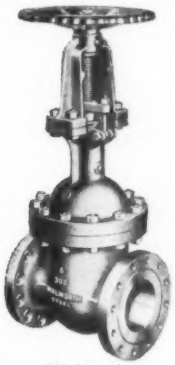


Walworth
Lubricated Plug Valve



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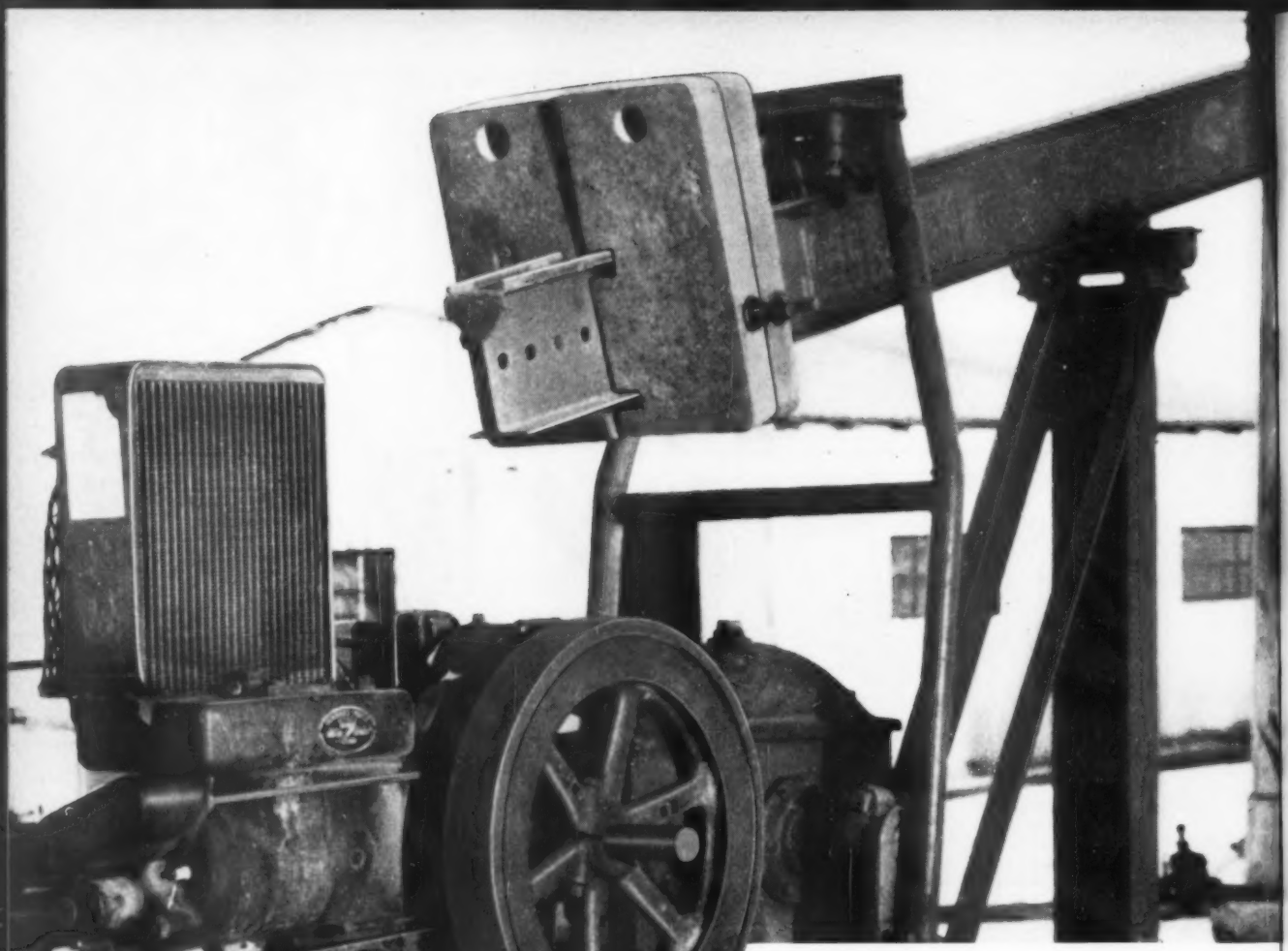

Sweet Operation in a Sour Situation!

Even we were surprised at the record hung up by the Fairbanks-Morse ZC Engine on this job. Operating on by-product natural gas with a hydrogen sulphite content in excess of 40 per cent . . . a sour-gas content *six times as high* as all previous notions of the allowable maximum . . . it's been running sweetly for almost two years.

It's typical of the ability of the ZC to keep going under the toughest of operating conditions . . . to operate efficiently and economically. Check your supply store for the ZC record or write Fairbanks, Morse & Co., Chicago 5, Ill.

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NEW CONDENSATE RECOVERY PROCESS

Hyreco* Unit eliminates Heater and increases stock tank liquid 10 to 25% while operating at greatly reduced temperature.

The Parkersburg Hyreco Processing Unit is a completely unitized high pressure gas well hook-up that entirely eliminates the need for a heater. It operates under conditions which provide for the condensation and recovery of from 10 to 25 per cent more stock tank liquid hydrocarbons per foot of gas flowed than can be obtained by conventional heater-separator installations. It is the only high pressure well head processing unit of its kind on the market today that offers a record of **proven** performance . . . three years of field testing on the toughest producing problems to be found in any field.

It has long been known that if it were possible within practical limitations to operate gas well separators at very low temperatures, condensation from the gas stream could be greatly increased and substantial gains in revenue would accrue to the operator . . . but previous to the development of the elements of the Hyreco unit such operation was impractical. This was because at very low temperatures much of the water content of the well fluid condensed and formed ice-like hydrates which quickly clogged and interrupted the flow of the entire system. When enough heat was applied to maintain safe flowing temperatures, the potential gains from cold operation were lost.

The Hyreco Processing Unit introduces a practical method, now in actual operation on several field locations, in which most of the troublesome water in the gas stream is mechanically removed at high pressure where it exists as a liquid. Having thus removed the basis for the low temperature formation of hydrates, the gas stream can be expanded with accompanying temperature reduction into a specially designed separator. This vessel provides a cold gas zone in which condensation is maintained at an optimum and a warm zone in which the condensed liquid is kept warm by the heat from the well fluid itself.

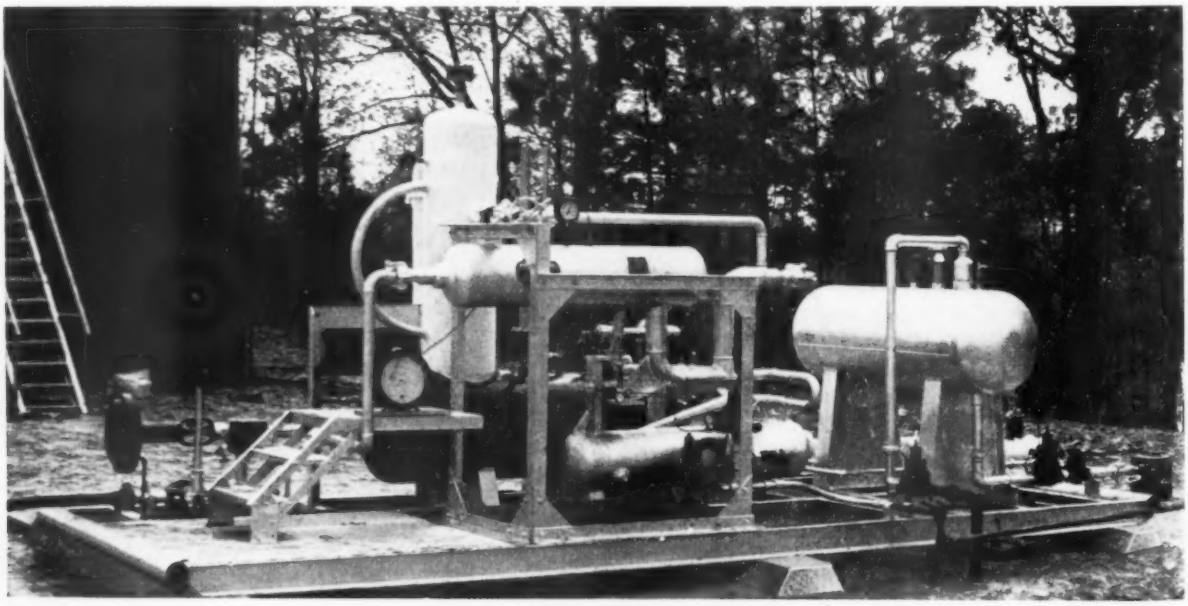
High pressure well fluid flows directly from the well head to the inside piping in the lower compartment of the specially designed high recovery separator. From here the well fluid, still at well head pressure, flows to the Hydracepter. Here the liquid water, which is the basic cause of freezing upon subsequent pressure reduction, is separated from the gas; as well as the small amount of hydrocarbons which condense at well head pressure.

In the lower chamber of the Hydracepter the water and the hydrocarbons separate. When the level of the hydrocarbons builds up to a specific point, the dry gas recombines with the previously separated liquid hydrocarbons, leaving the water behind. The gas stream then flows through a choke into the cold zone of the high recovery separator. Here the pressure of the gas drops from well head pressure to separator pressure with an accompanying reduction in temperature. At this decreased temperature in the cold zone of the separator the condensation of hydrocarbons is much greater than could take place in the conventional separators operated at warm gas temperature higher than the point at which hydrates will form. At the same time, some of the very small amount of water remaining in the gas stream condenses. However, this condensed water along with the condensed hydrocarbons fall to the warm zone of the separator which is kept warm by the incoming well fluid flowing through the inside piping. Thus the possibility of flow interruption due to formation of hydrates is completely eliminated.

The dry, cold gas passes out at the top of the separator. The liquids in the lower warm compartment are dumped automatically into the second stage flash chamber and then pass to the stock tanks exactly as in a conventional stage separator hook up.

Additional data about the performance and application of the Hyreco Processing Unit may be obtained directly from the manufacturer, The Parkersburg Rig & Reel Company, Parkersburg, West Virginia.

*Trademark.



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PARKERSBURG HYRECO PROCESSING UNIT is the only equipment of this type available today that has a record of proven performance . . . ask for comparable evidence about similar equipment.

INCREASED RECOVERY at point of separation, combined with all the benefits of stage separation to decrease the tank loss, is accomplished only with Parkersburg Hyreco Processing Unit.

★

HEATERS ARE UNNECESSARY with the Hyreco Processing Unit, thereby eliminating trouble and the potential danger of fire.

★

NO OTHER SIMILAR EQUIPMENT in use or being offered today can process gas at comparably low separator temperatures.

★

IN SOUTH TEXAS, a Hyreco Processing Unit increased hydrocarbon recovery from 25 bbls to 31.6 bbls for each million feet of gas flowed.

★

INCREASED NET EARNINGS UP TO $900.00 per month from condensate sales have been made by users of Hyreco Processing Units.

★

15% INCREASED RECOVERY with the Hyreco Processing Unit meant 137 extra barrels of hydrocarbon in 22 days from one Louisiana well.

★

TANK LOSS OF LESS THAN 1% was recorded on a 24 hour weathering test with the tank hatch wide open. You pipe-line what you recover!

★

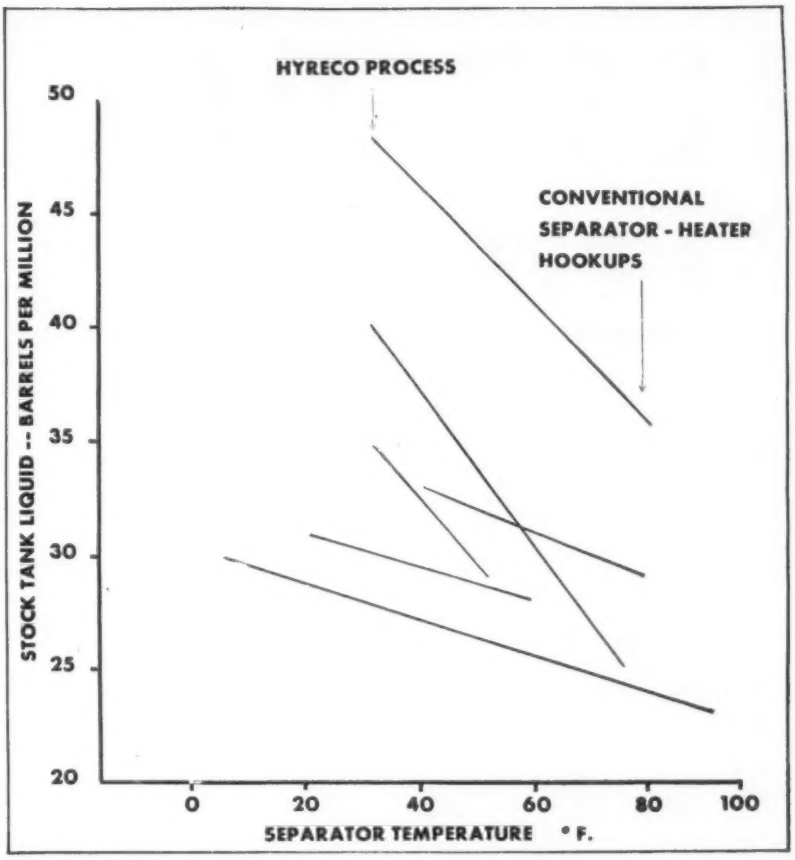
COMPLETELY UNITIZED, compact and skid-mounted, with all piping pre-fabricated, the Parkersburg Hyreco Processing Unit is ready for quick, easy handling and installation.

★

HYRECO UNITS PAY FOR THEMSELVES in a few months . . . thereafter they pay extra dividends that no other installation can match.

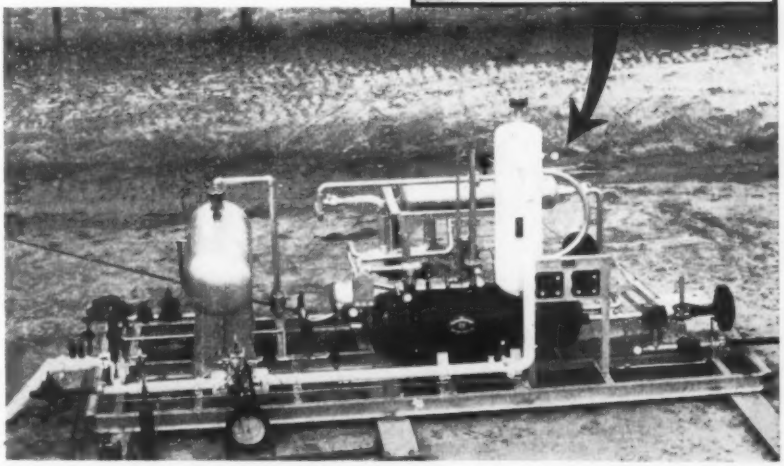
★

ADDITIONAL DATA available from the manufacturer, The Parkersburg Rig & Reel Company, Parkersburg, West Va.



Curves indicate recovered stock tank liquid quantities from different wells produced by Hyreco process as compared to liquid obtained by conventional separator-heater hookups.

Enlarged photo of thermometer registering temperature of gas inside cold zone of high recovery separator. The reading is one degree above zero. In the lower photo notice the entire upper compartment of the separator as well as the outlet line is completely coated with ice and frost. The Hyreco Unit is operating perfectly and completely free from freezing while processing gas at this extremely low temperature.



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*FLOSEAL packing elements give leak proof packoff under differential pressures to 7,000 psi, at temperatures up to 300°F, without vulcanizing to the casing.

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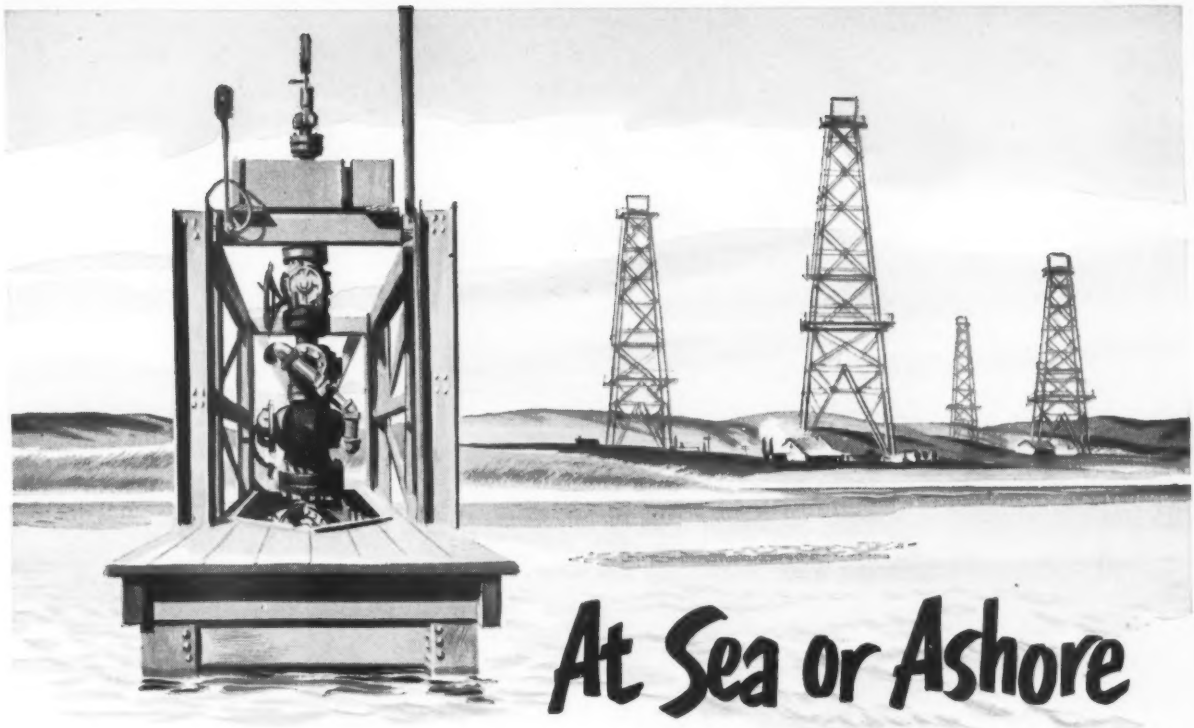

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maintenance costs dive with coatings based on VINYLITE Resins
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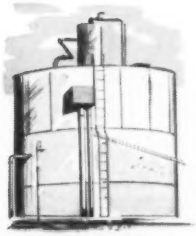
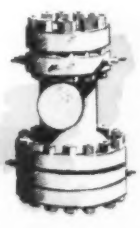
The complete story of these remarkable coatings is well worth looking into. Get all the facts now. Write Dept. IN-68.

Data courtesy Plastic Coating Corporation, Houston 19, Texas





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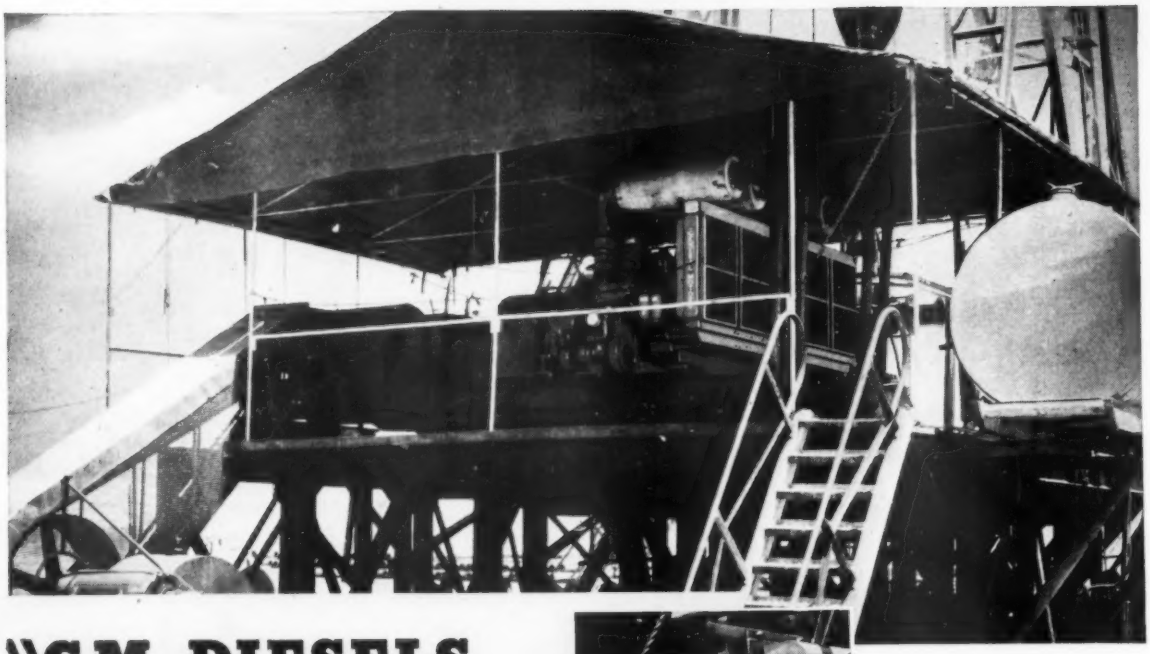

"GM DIESELS *give us faster round trips*"

says James G. Cullum of Wichita Falls, Texas

Wilson Giant rig, operated by Cullum Brothers Drilling Co., is powered by two GM Series 71 Diesel Twin sixes delivering 276 continuous H.P. per twin at 1000 RPM shaft speed. Table speed up to 180 RPM. Gardner-Denver 7¾ x 16 mud pump, V-belt driven from chain compound, delivers 650 to 700 lbs. pressure with 7¼" liners, 63 strokes per minute.

THE sizzling pace young Jim and Landon Cullum are setting for speedy completions in the North Texas fields has won them the reputation of "fastest drillers in the area."

Records like this tell the story: 70,000 feet of hole drilled in the first 8 months—4,000 feet in 4 days and 9 hours, using 13 bits—and, on a speed test, 1,450 feet with one bit in 9 hours. What do you find powering Cullum Brothers' rig? General Motors Series 71 Diesel engines.

These modern 2-cycle Diesels are compact as well as powerful. They're lower in weight as well as husky. They pick up under load fast and they stay on the job.

Oil men everywhere are finding that GM "71" Diesels make drilling faster, easier and much more profitable. It's sure worth looking into. Let us see that you get the full details.

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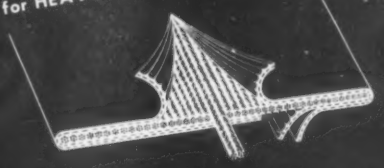

The COMPASS belt is bodied with multi-strand cords, spiraled continuously without a splice. Cords on opposite side of belt axis are twisted in opposite directions to insure true running.

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	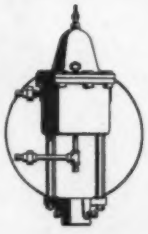	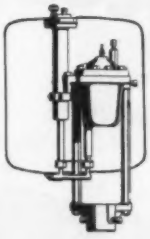	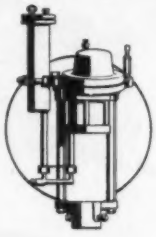	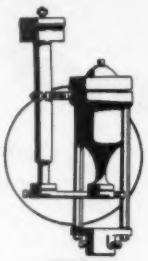
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6	Forged Steel	3500	100"—200"

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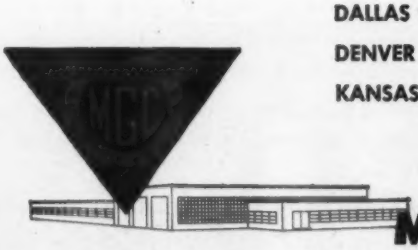
NEW ORLEANS 12, LOUISIANA	432 Julia Street	Canal 7373
DALLAS 9, TEXAS	6211 Cedar Springs Rd.	Dixon 4-3925
DENVER 2, COLORADO	817 Seventeenth	AComa 5891
KANSAS CITY 16, MISSOURI	1300 Burlington	NOrclay 3516

*Not warehoused in Kansas City or St. Louis.



METAL GOODS CORPORATION

XUM

A SLUGGER THAT'S NOT A SLUGGARD

★ **HOWARD CANYON FIELD.** The "Caterpillar" D8 Tractor, with No. 8S Bulldozer, shown here, slugged out this ½-mile oil-well access road in 8 hours. Owner: M. Sanchez & Sons. They operate a whole fleet of "Caterpillar" Diesels. They say, "It's one hundred per cent 'Caterpillar' for us. In 11 years we've used many types, with 'Caterpillar' units proving the best from both upkeep and operating standpoints."

AN OIL FIELD is no place for a tractor that can't stand up under the "murderous" pace and punishment encountered in slashing out roads, drill sites, slush pits, fire walls, or what-have-you. It can't be a weakling. Or a loafer. Or a "flash in the pan" that's down half of the time. It's got to have *stamina* and *dependability*—PLUS brute *power*.

Like the prize fighter who can stay on his feet and slug it out round after round, the tractor that can "take it and give it" day after day is the one that comes through with the biggest pay-offs.

"Caterpillar" Diesel Tractors are made of stuff like that. They're tough! They don't need "long counts" (down time). They're quick on the comeback. Should, eventually, a new part or a fix-up be in order, there's efficient and quick-acting dealer service standing by. "Caterpillar" leaves nothing undone toward building—and keeping—60-second minutes, 60-minute hours, 24-hour days of *fighting performance* into every unit that bears its name.

Ask your "Caterpillar" dealer for the proof—in mechanical evidences, in user experiences, in demonstrations.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

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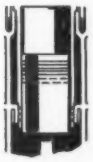
LOOK UNDER THE HIDE *for the qualities that pay off in tractor performance and long life . . . you'll find them in every "Caterpillar" detail. For example:*

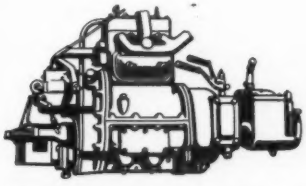
Hard Chrome-Faced Compression Rings are standard on all models of "Caterpillar" Diesel Tractor Engines —increasing life and performance at critical point of engine design.



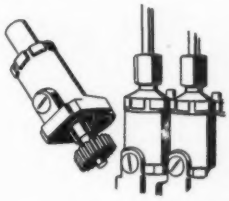
Alloy Iron Wet Type Cylinder Liners are "Hi-Electro" hardened — giving exceptionally long life. Wearing surface is chemically treated for proper break-in.

Solid Aluminum Alloy Connecting Rod and Main Bearings are exclusively "Caterpillar." Advantages: low rate of wear; fine heat-transfer characteristics; high corrosion resistance.

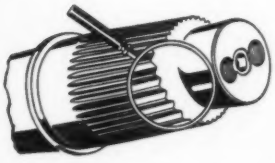
Air-Cooled "Lube" Oil. Air cooling lowers oil temperatures — reducing carbon, minimizing gum formations, and adding to the efficient serviceable life of working parts.



Independent Starting Engine of exclusive "Caterpillar" design gives safe-and-sure starts at all times, and allows the Diesel to build up full oil pressure before starting.

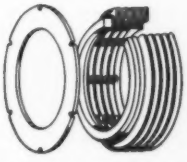


"Caterpillar"-Built Fuel Injection System is perfectly matched for "Cat" Engines. Pumps and valves require no adjustments, and are replaceable in the field—like spark plugs.

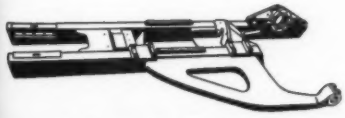


Tapered Splines—specially developed by "Caterpillar"— lock sprockets securely to shafts. So effective have they proved that the principle is similarly applied to other vital parts.

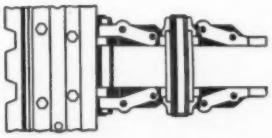
"Hi-Electro" Hardened Final Drive Gears. Teeth are three times harder after treatment and gear life is further boosted by the favorable compressive stress this process supplies.



Bellows Seals are self-aligning, self-adjusting and self-lubricating—keep oil in, dirt and water out without need for take-up adjustment or periodic attention.



Correct Track Alignment, both vertically and laterally, is assured with this rigid roller frame. Heavy diagonal brace and widely spaced bearings add life to tracks and rollers.



Counterbored Track Links — to provide a tighter, better sealed joint and greater bearing surface between bushings and track pins. Extra assurance of long life in abrasive soils!

Hour Meter to give user the facts on tractor performance and life. Hour meters have always been standard on "Cat" Engines because "Caterpillar" has nothing to hide.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

XUM

Feel fine... all the time!

OPEN YOUR OFFICE IN DENVER

The Major Metropolis of the Oil-Rich Rocky Mountain [illegible]
Close to All Important Fields

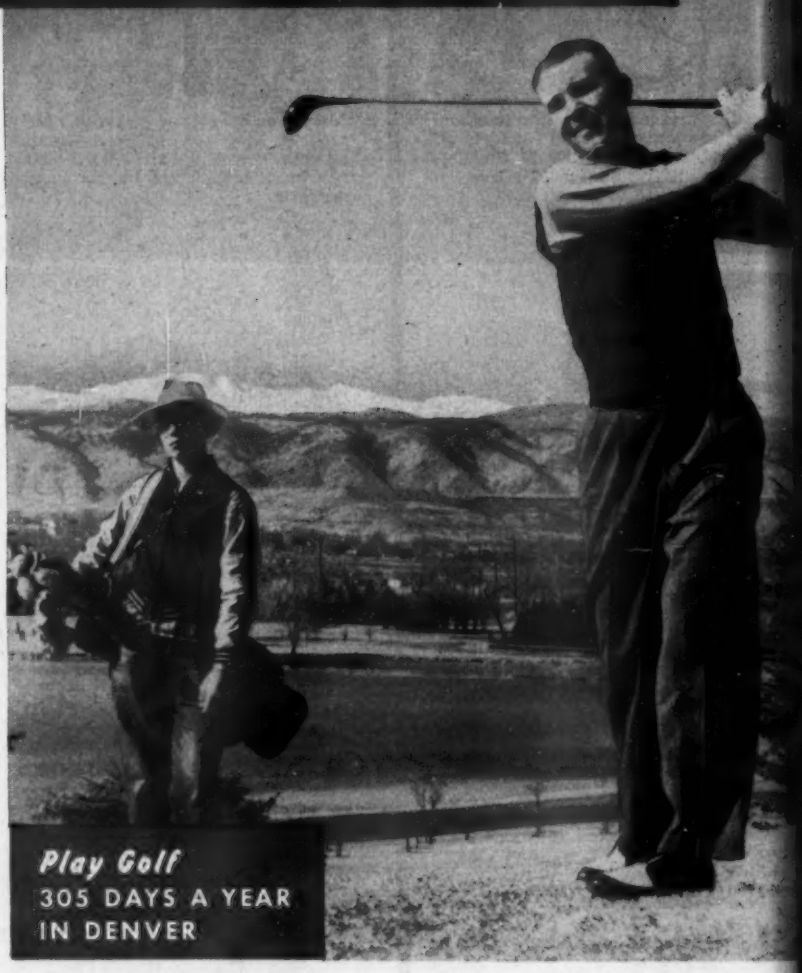
YOU REALLY *LIVE* IN DENVER

THE CITY OF COOL SUMMERS AND MILD WINTERS

Want to sleep under a blanket all summer? Want to enjoy mild, sunny winters? Want to live better—work better—feel fine ALL the time? Then open your Rocky Mountain office in Denver—where more producers, refiners, and distributors now headquarter.

Your Denver office is in the midst of vast new oil areas containing the greatest percentage of recent discoveries in the United States—near all the oil people you deal with.

Find out today why you can **profitably** open your office in Denver—and really begin to LIVE!



Play Golf
305 DAYS A YEAR
IN DENVER

WHY MORE OIL MEN NOW HEADQUARTER IN DENVER...

- Center of Public Land activity—close to important fields.
- Excellent transportation by air, train, bus, and car to North, South, East, and West.
- Convenient interrelations between oil companies—most of whom are located here.
- Good supply of intelligent help at fair wages.
- In the middle of vast new oil areas—containing the greatest percentage of recent discoveries in the United States.
- Fine schools—modern housing—and a variety of unexcelled recreational facilities for all ages.

(Write Carl E. Berg, Industrial Director of the Denver Chamber of Commerce, for a copy of the booklet "You Really Live in Denver," and for specific details on how your business could move to Denver.)

INDUSTRIAL DEVELOPMENT COUNCIL

DENVER CHAMBER OF COMMERCE

CHAMBER OF COMMERCE BUILDING DENVER 2, COLORADO

XUM

JUN

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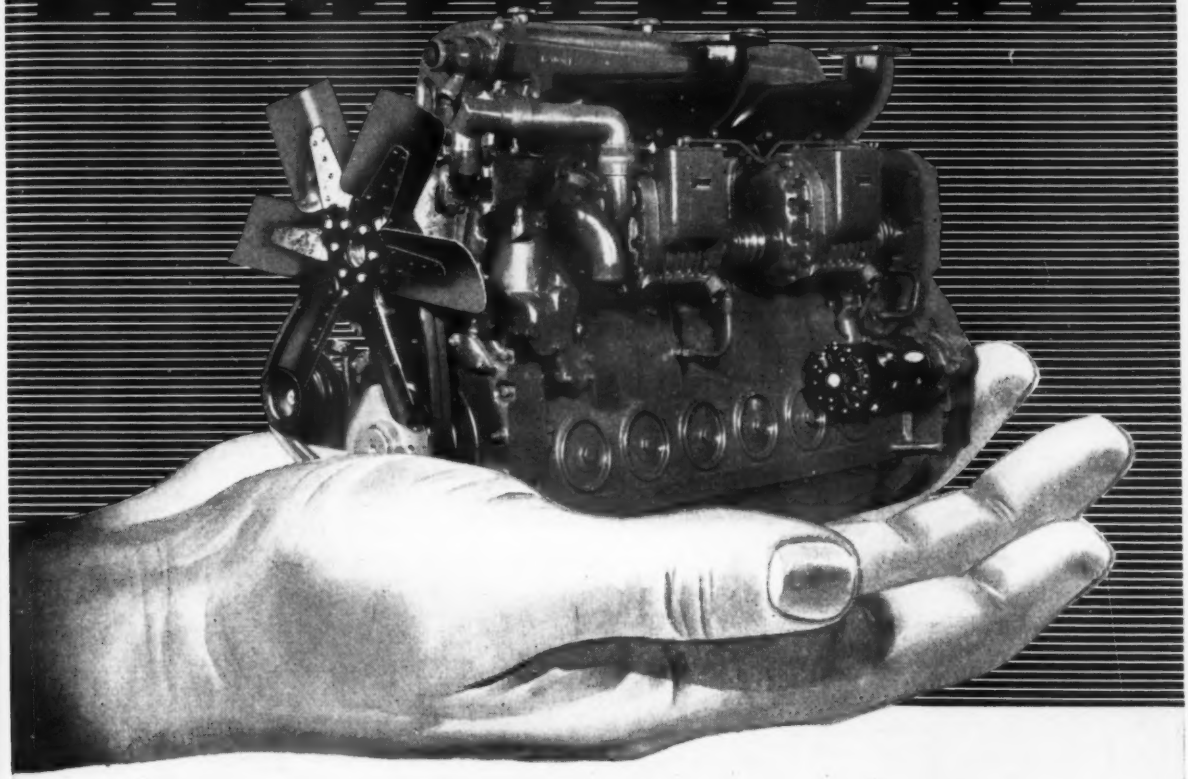
LIGHTWEIGHT



P&H DIESEL ENGINES

(2 CYCLE)

Now, for the first time, a line of diesel engines in which *all* major castings are of lightweight alloys. This is what you have waited for . . . *less weight per horsepower,* rugged design for the toughest jobs . . . proved performance. And longer life, too! Write for literature. Diesel Division, Harnischfeger Corp., Port Washington, Wis.

P&H DIESEL DIVISION

HARNISCHFEGER CORPORATION

PORT WASHINGTON WISCONSIN. U. S. A.

XUM

Bite firm enough to safely hang on to a 20,000-foot string of casing . . . bite gentle enough not to mar or collapse any of that casing . . . you get both features with "Ideal" Automatic Elevators and Spiders.

Precision-machined insert-type wickers made of extra-tough steel are used in the slips of "Ideal" Type "S" Automatic Elevators and Spiders. And with "Ideal" insert-type Slips, you can make quick, economical replacements right at the rig . . .

Here are other advantages of "Ideal" Automatic Elevators and Spiders . . . unit operation of all four slips; spider cannot be released until elevator has taken casing load; maximum workman safety.

Write for bulletins describing "Ideal" Automatic Elevators and Spiders, and the new, better "Ideal" insert-type Slips.

THE NATIONAL SUPPLY COMPANY
GENERAL SALES OFFICES: TOLEDO, OHIO
NATIONAL BLUE PRODUCTS

NATIONAL OIL FIELD MACHINERY AND EQUIPMENT
SPANG PIPE . . . SUPERIOR ENGINES

DIVISION OFFICES: CASPER, FT. WORTH, PITTSBURGH, TULSA, TORRANCE.

CANADA: THE NATIONAL SUPPLY COMPANY, LIMITED, ROOM 202, ALBERTA BLOCK, CALGARY, ALBERTA.

EXPORT: NATIONAL SUPPLY EXPORT CORPORATION, 30 ROCKEFELLER PLAZA, NEW YORK, N. Y., U. S. A. RIVER PLATE HOUSE, 12 SOUTH PLACE, LONDON E.C.2.

Kellogg has engineered Catalytic Polymerization Units for 22 different refineries operated by:

- Argentine Government Oil Fields
- Anglo-Iranian Oil Company, Ltd.
- British American Oil Co., Ltd.
- Continental Oil Company
- El Dorado Refining Company
- Globe Oil & Refining Company
- Gulf Oil Corporation
- Kanotex Refining Company
- Lion Oil Company
- Magnolia Petroleum Company
- Mid Continent Petroleum Co.
- Roosevelt Oil & Refining Corporation
- Skelly Oil Company
- Standard Oil Company (Ohio)
- The Texas Company
- Wasatch Oil Co.
- Wood River Oil & Refining Co.

More than 240 million gallons of 80+ octane* gasoline will pour this year from Kellogg "Cat-Poly" Units!

* CFR-M

. . . Yes! Kellogg-engineered "Cat-Poly" Units deliver more than 600,000 gallons of high octane blending-polymer every 24 hours . . . with additional capacity now building!

CATALYTIC POLYMERIZATION is, naturally, an important factor in modern refinery economics. It is one of the recognized methods that refiners may utilize to control their over-all refinery vapor pressure balance. Moreover, it is an excellent source for obtaining the high octane-blending stock necessary to meet today's gasoline quality standards.

However, initial cost of facilities and daily operating costs are two major factors refiners must examine closely if they are to gain full benefit from the process.

Along these lines, Kellogg has contributed greatly toward lowering initial costs by building units that utilize soaking drums from outmoded thermal crackers. In its continuing efforts to reduce daily operating costs, Kellogg has perfected a long-life catalyst that appreciably lengthens on-stream runs.

Having started better than fifteen years ago in the field of polymerization, Kellogg became one of the original members of the POLYCO group, which licenses the basic process. This development experience in the field of catalytic polymerization, plus an outstanding position in the building of commercial plants, should merit the careful consideration of every refiner considering the addition of polymerization facilities.

CATALYST LIFE ONCE A MAJOR PROBLEM IN "CAT-POLY" ECONOMICS . . .

Major factors in the daily operating cost of a Catalytic Polymerization Unit are the cost of catalyst and the down time required to replace it. Operating at high pressure ordinary catalysts have a tendency to agglomerate quickly, producing recurrent sudden pressure drops and requiring frequent and expensive replacement.

Kellogg tackled this problem and developed a new catalyst which retains its original pelleted form and resists softening better than other types on the market. Today Kellogg manufactures this catalyst in its own plant in Jersey City.

IT TAKES ALL SEVEN TO PRODUCE GREATER EARNING POWER . . .

1 THE DEVELOPMENT "TOOLS"
—laboratories, pilot plants and recognized specialists to prove and improve processing and equipment ideas.

2 PROCESS ENGINEERING
by three distinct groups of specialists—*sequence* engineers, *unit* engineers and *development* engineers—supported by an extensive reservoir of exclusive data.

3 SPECIALISTS IN EVERY PHASE
of design engineering due to the completeness of Kellogg's engineering staff.

4 SPECIALIZED BUYERS
backed by the cumulative buying power of the largest company in the business.

5 COMPLETE FABRICATING FACILITIES
to make schedule deadlines and to develop workable "firsts" in refinery equipment.

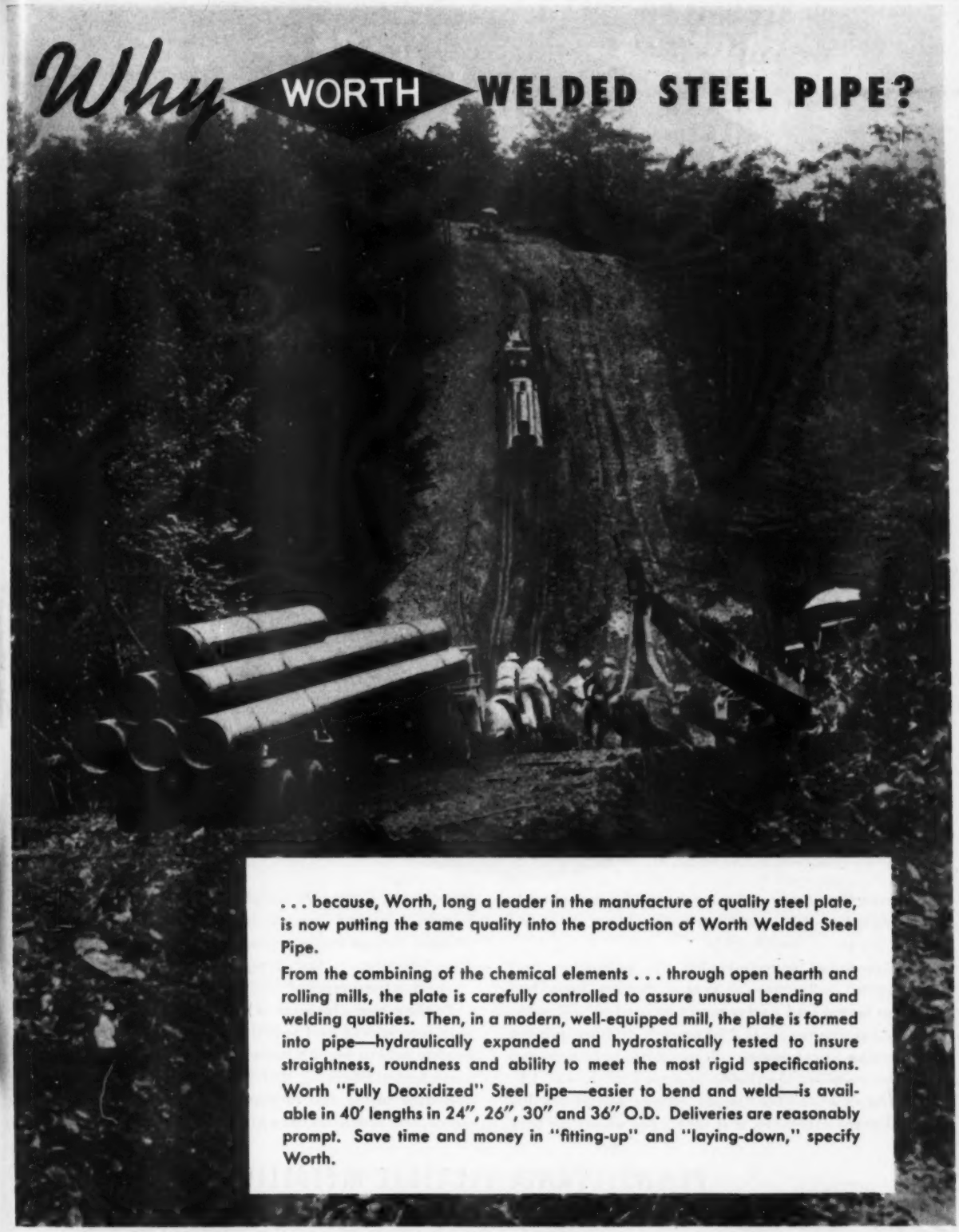
6. CONSTRUCTION KNOW-HOW
acquired in completing hundreds of major jobs, plus an ample supply of the proper tools, plus the development of new time-saving methods assure maximum efficiency on the construction lot. Kellogg's Construction Department has not only pioneered the use of such construction time-savers as guy derricks and pre-fab buildings but it has also developed, in connection with Kellogg labs, special welding, pipe-bending and stress-relieving techniques that have lowered construction costs and improved the efficiency of Kellogg-built plants. Permanent Kellogg construction crews, staffed from craft foremen up, operate throughout the United States, Canada, England, continental Europe, and South America.

7 PRACTICAL OPERATING COUNSEL
on all design and construction, achieved through practical operating men working as an integral part of the company.

. . . AND ONLY KELLOGG HAS ALL SEVEN!

The M. W. Kellogg Company, (a subsidiary of Pullman, Inc.), New York, Jersey City, Los Angeles, Tulsa, Houston, Toronto, London, Paris

Why WORTH WELDED STEEL PIPE?



. . . because, Worth, long a leader in the manufacture of quality steel plate, is now putting the same quality into the production of Worth Welded Steel Pipe.

From the combining of the chemical elements . . . through open hearth and rolling mills, the plate is carefully controlled to assure unusual bending and welding qualities. Then, in a modern, well-equipped mill, the plate is formed into pipe—hydraulically expanded and hydrostatically tested to insure straightness, roundness and ability to meet the most rigid specifications.

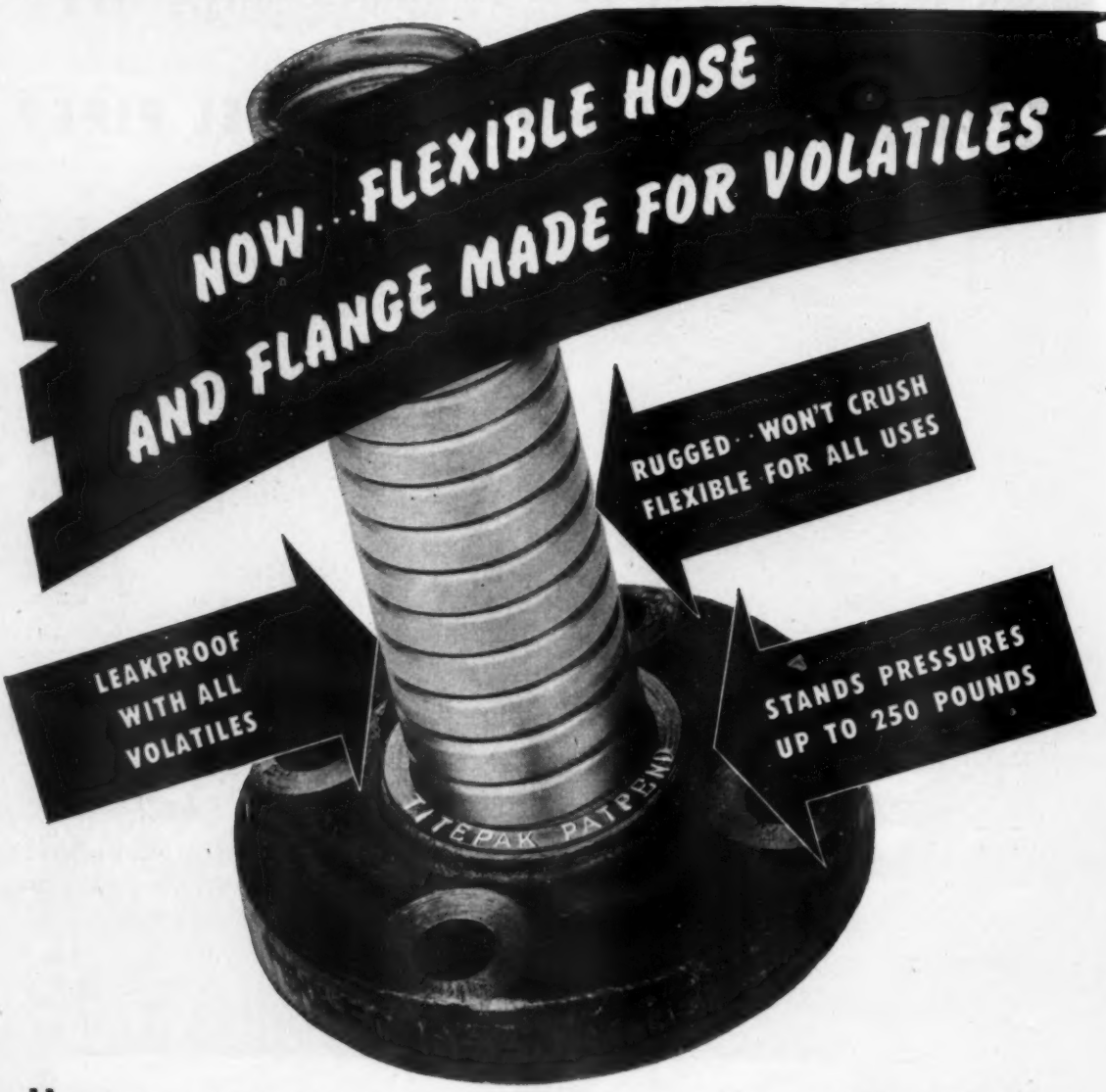
Worth "Fully Deoxidized" Steel Pipe—easier to bend and weld—is available in 40' lengths in 24", 26", 30" and 36" O.D. Deliveries are reasonably prompt. Save time and money in "fitting-up" and "laying-down," specify Worth.

FLANGED AND DISHED HEADS • CARBON AND STAINLESS-CLAD STEEL PLATES

WORTH STEEL COMPANY • Claymont, Delaware

XUM

NOW...FLEXIBLE HOSE AND FLANGE MADE FOR VOLATILES



Here's the hose and flange that will handle highly volatile liquids . . . will not leak . . . yet is rugged . . . tough . . . and flexible.

Developed especially for the petroleum and chemical industries, this new Penflex hose has been tested and performance-proved. It will withstand pressures up to 250 pounds and has proved its value in conveying oil, gasoline, kerosene and other volatiles. Available in sizes 2½" to 12" I.D.

The new Penflex Titepak Flange completes this leakproof assembly. It is leakproof under all conditions . . . lighter in weight than other types of flanges . . . and is much lower in price. Penflex Titepak Flange assures greater efficiency in handling volatiles . . . lasts longer . . . is more rugged . . . and is tamperproof.

Penflex manufactures a complete line of four wall interlocked and seamless welded corrugated flexible tubing for the petroleum industry . . . automatic barrel fillers . . . pneumatic rivet passers . . . and accessories and fittings. To cut your maintenance, write for your copy of "Flexineering at Work."

PENNSYLVANIA FLEXIBLE METALLIC TUBING CO.

7213 Powers Lane **Philadelphia 42, Pa.**

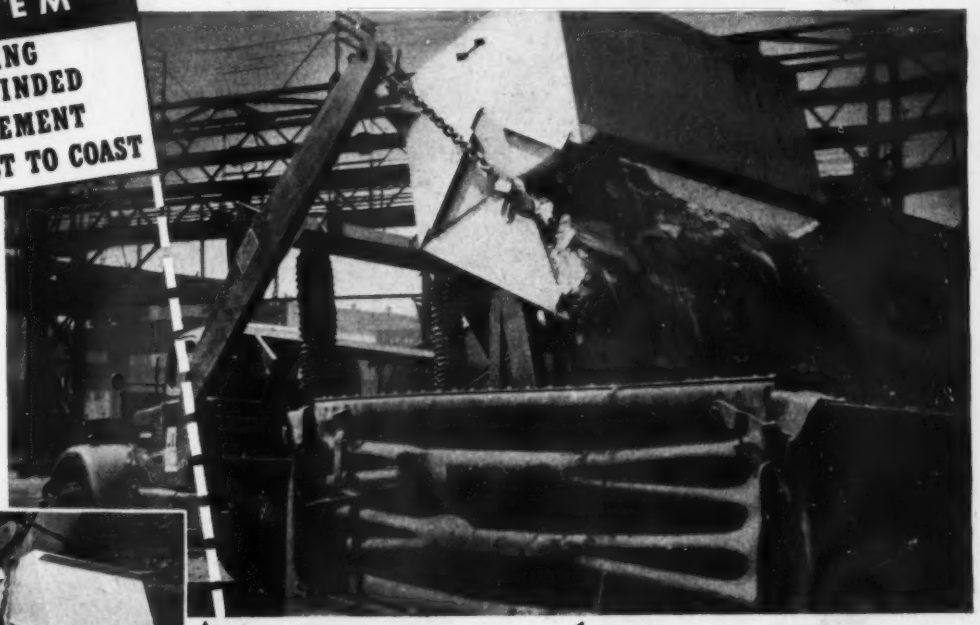
Branch Sales Offices—BOSTON • NEW YORK • CLEVELAND • CHICAGO • HOUSTON • LOS ANGELES

Penflex... HEART OF INDUSTRY'S LIFE LINES

DEMPSTER DUMPSTER
TRADE MARK REG.
SYSTEM

SERVING COST-MINDED MANAGEMENT FROM COAST TO COAST

. . . handling bulk materials of every description at phenomenal savings



Photos show the three simple stages of servicing a container. The Dempster-Dumpster, operated from hydraulic controls by driver in the cab, picks up each container and hauls it to point of disposition where it may be dumped or set down intact.

J&L STEEL

—recognized across the nation

. . . Jones & Laughlin Steel Corp., well known for sound management, uses the Dempster-Dumpster System

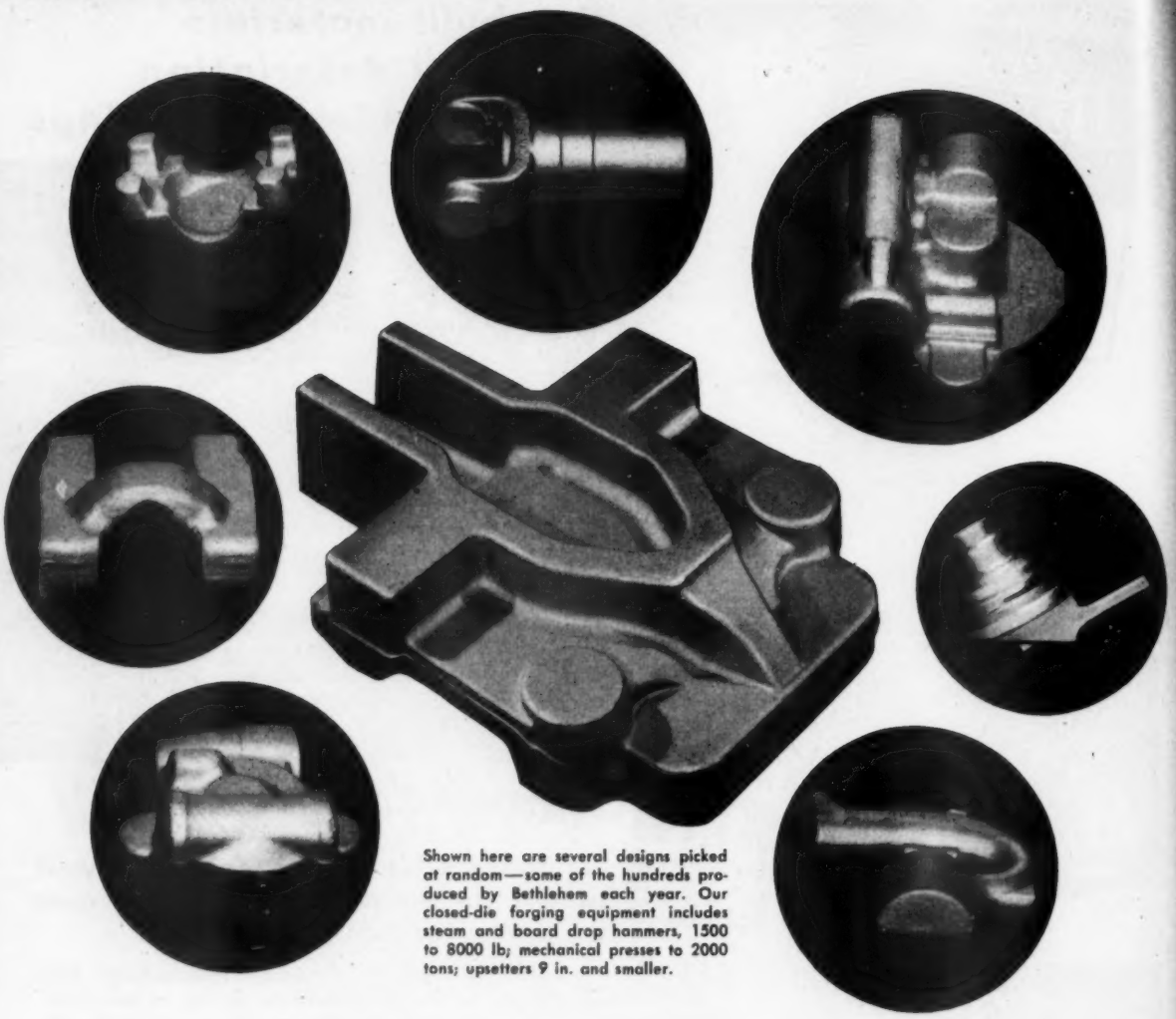
J & L Steel is among the hundreds of well managed manufacturers, both large and small, who use the Dempster-Dumpster System of bulk materials handling . . . the system recognized across the nation for its efficiency and ability to reduce costs.

There is never an idle moment for a truck mounted Dempster-Dumpster around a manufacturing plant. With a variety of Dempster-Dumpster containers spotted inside and outside your plant, one truck mounted Dempster-Dumpster, with only one man, the driver is kept busy servicing one pre-loaded container after another. These detachable containers, ranging in size up to 12 cu. yds., carry pay-loads equal to conventional truck bodies. They are built in a wide variety of designs best suited to the type of materials handled—be they bulky, light or heavy . . . solids or liquids . . . trash or rubbish.

In addition to cutting man-hours and reducing truck investment, gas, oil, maintenance costs, the Dempster-Dumpster System improves "housekeeping" methods . . . reduces fire hazards . . . provides an easier, quicker, safer and more efficient manner of handling materials. It will pay you to investigate the Dempster-Dumpster System now! A product of Dempster Brothers, Inc.

One Dempster-Dumpster Services All Containers. . . All Designs. . . All Sizes

DEMPSTER BROTHERS, 560 Dempster Building, Knoxville 17, Tennessee



Shown here are several designs picked at random—some of the hundreds produced by Bethlehem each year. Our closed-die forging equipment includes steam and board drop hammers, 1500 to 8000 lb; mechanical presses to 2000 tons; upsetters 9 in. and smaller.

At Bethlehem . . . an almost endless variety of DROP FORGINGS

Bethlehem is so well equipped for drop-forging work that innumerable designs can be handled in weights ranging from 1½ to 200 lb.

This means, of course, that we are able to serve the needs of many different industries—automotive, petroleum, aviation, electrical, and numerous others.

At Bethlehem the drop-forging service begins with the making of the steel, carbon or alloy, and carries through all the operations of die-sinking, forging, treating, cleaning, etc. Every phase is under our direct control, enabling us to check and double-check on quality all the way through.

Let us bid on your future business. We have much to offer that every user of drop forgings should know about.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

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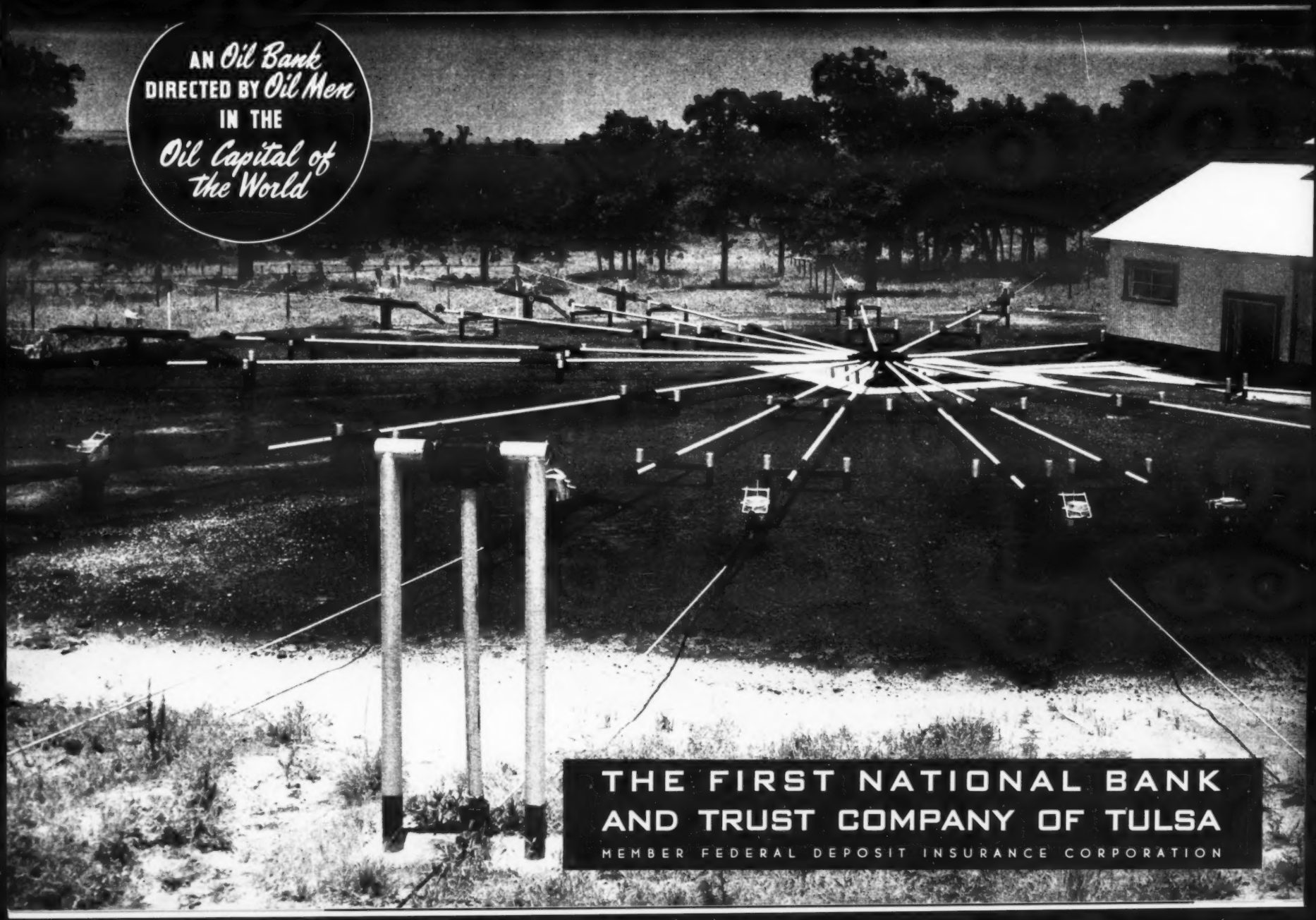
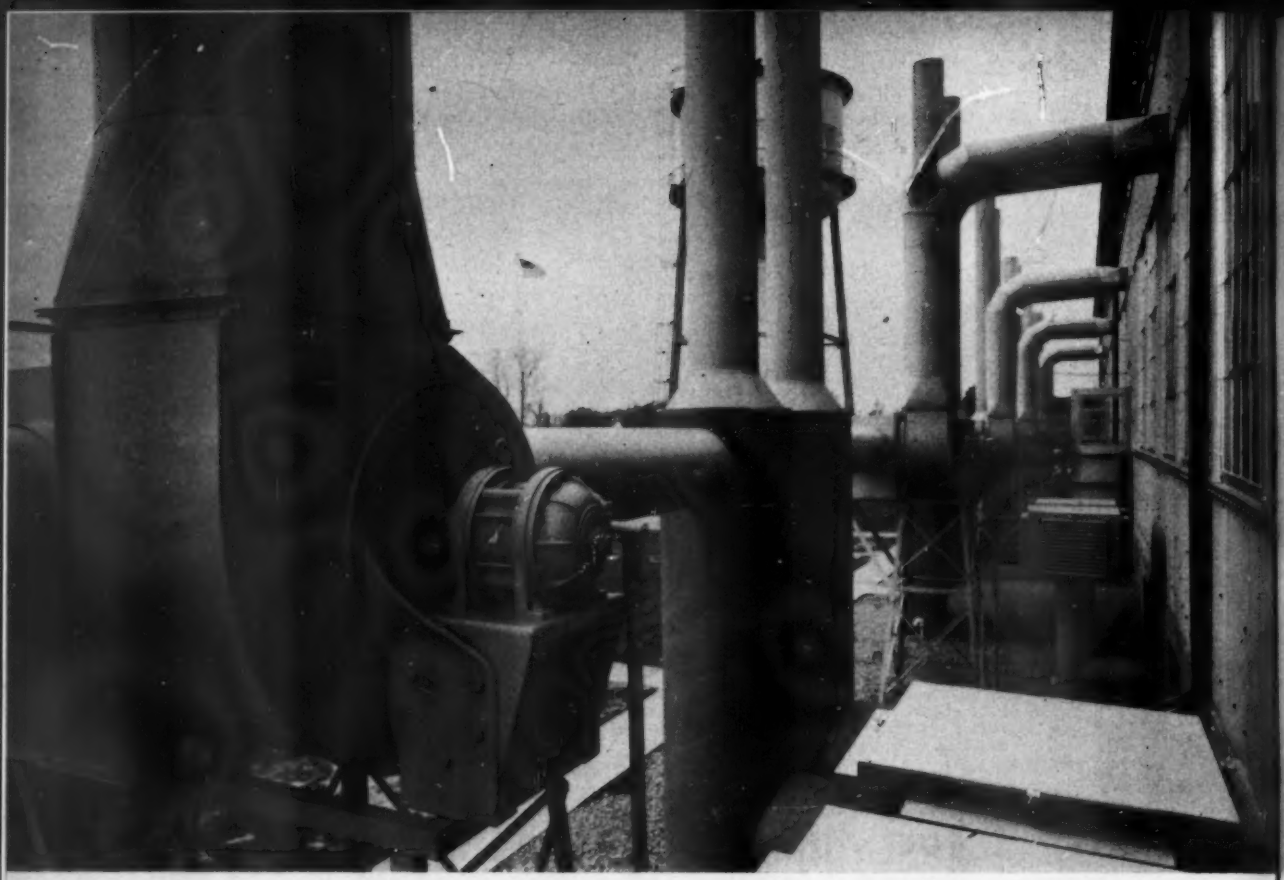

AN Oil Bank
DIRECTED BY Oil Men
IN THE
Oil Capital of
the World
THE FIRST NATIONAL BANK
AND TRUST COMPANY OF TULSA
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION



Where Dependable "Buffalo" Exhaust HELPS THE MAIN LINE BOOSTERS!

● The "Buffalo" Limit-Load Fans shown here are exhausting from 1300 h.p. booster engines on the main line of a well-known pipe line company. It's a rugged job for a fan, because it's continuous service. It's also no place for a fan that breaks down. That's why the choice was "Buffalo" . . . for efficiency, for durability, for low-cost maintenance. Remember, when you pick fans for large-scale jobs, that "Buffalo" Limit-Load Fans are:

1. *Non-overloading.* You cannot overload the motor, regardless of system pressure.

2. Available in exactly the size and arrangement your installation requires. Complete choice.

3. The choice of many leading engineers because of their performance characteristics.

"Buffalo" FIRST FOR FANS

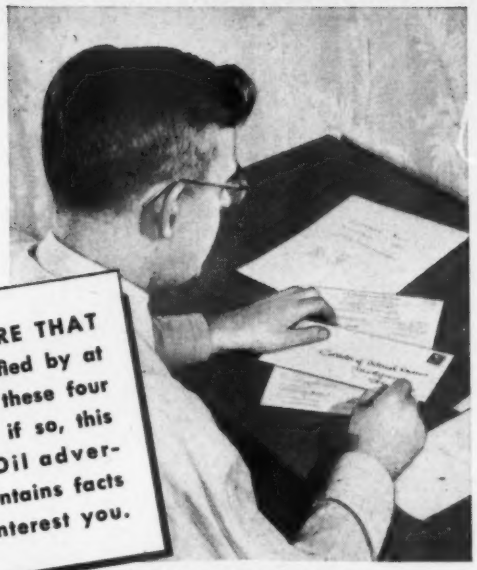
WRITE FOR BULLETIN 3737

BUFFALO FORGE COMPANY

525 BROADWAY · BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont., Branch Offices in all Principal Cities

VENTILATING FORCED DRAFT · AIR WASHING COOLING · AIR TEMPERING HEATING · INDUCED DRAFT EXHAUSTING PRESSURE BLOWING



CHANCES ARE THAT YOU are typified by at least one of these four people—and if so, this Standard Oil advertisement contains facts that will interest you.

EDWARD HAYNES OF MINNEAPOLIS

Are you an American taxpayer? So are we. Out of every dollar we took in last year, we paid out 17.2 cents in taxes—*more than we paid our 46,700 employees and about six times what we paid our 96,800 owners.* This includes taxes collected by us for governmental agencies, but does not include the many "hidden" taxes that we and you both pay. Taxes are necessary, but it takes thousands of profitable businesses like ours, as well as millions of individual taxpayers like you, to pay the cost of government.

H. W. TURNER OF OUR CASPER, WYOMING, REFINERY

Are you a Standard Oil employee? For you and your fellow workers (we have a total of 46,700 employees) we spent 16.4 cents out of every dollar we took in last year for wages, salaries and employee benefits. Our employees averaged $4,600 each in wages and benefits last year. They and their immediate families are protected by one of the finest, broadest employee benefit programs in any industry. The benefit program includes a retirement plan to which employees and the company both contribute.

ARE YOU ONE OF THESE FOUR PEOPLE?

You, as a citizen of the United States, almost certainly belong to at least one of the groups that these four people represent. If so, you want to know whether we are making a profit.

"Making a profit" and "running a sound business" mean the same thing to us. It's important to a lot of people that our business remains sound, for all of the money that Standard Oil and its subsidiary companies take in is eventually spent to serve one or more of these four groups of people. From every dollar we take in, one hundred cents is distributed, paid out, spent, or put to work.

Because you are one of these groups of people, you stand to benefit when we make a profit.

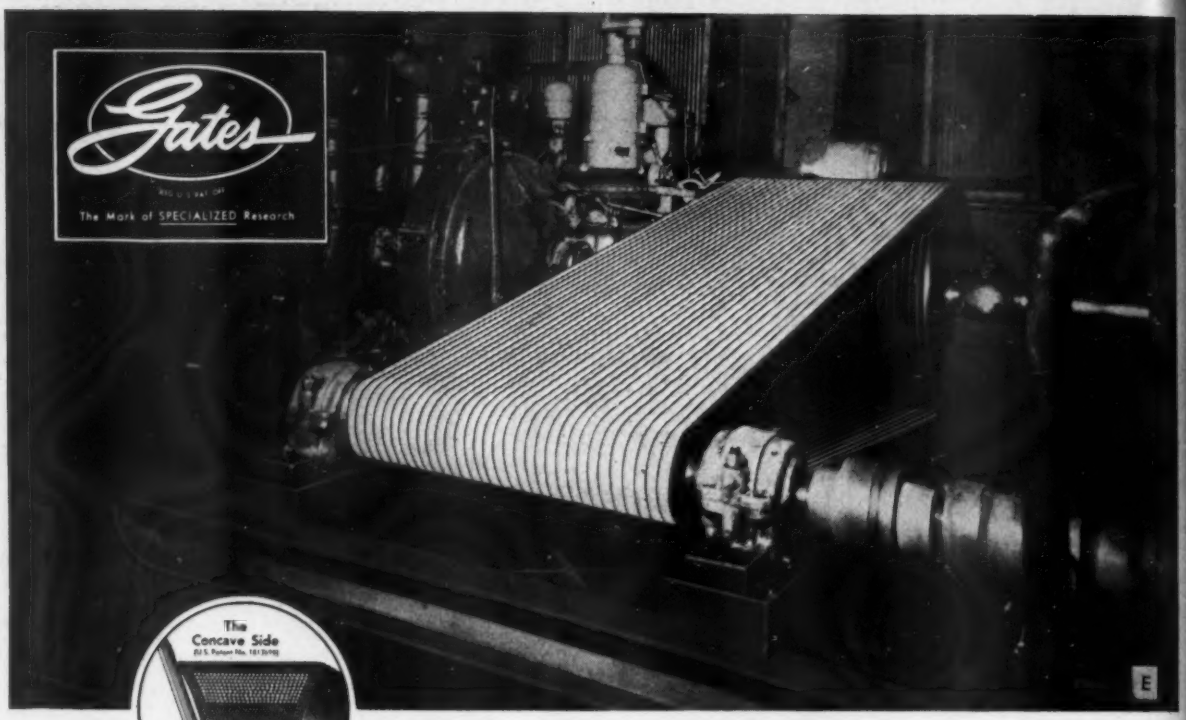
STANDARD OIL COMPANY (INDIANA)

MRS. ALVINA BASSLER OF BELLEVILLE, ILLINOIS

Are you one of the 96,800 owners of Standard Oil? All of you together received, in dividends, 2.9 cents out of every dollar we took in last year. And 4.8 cents out of every dollar was retained in the business, largely to help pay for new equipment which helps increase the book value of owners' stock, the productivity and earning power of employees and the supply available to customers.

BERYL PRIDE OF EVANSVILLE, INDIANA

Are you a customer of Standard Oil, or a customer of an independent dealer who sells our products? For materials, transportation and wear and tear, our costs were 58.7 cents out of every dollar we took in last year. Adding this to our taxes, labor cost and a fair return on the investment that enables us to supply you, 100 cents out of every dollar you spent with us was put to work.



The cylinder at the right houses a 75-stage centrifugal pump. It requires 112 H.P., turns at 36000 r.p.m., and maintains a 1925-ft. head in an oil field water repressuring project. The belt speed is high, nevertheless, the Gates Vulco Rope Drive is doing a fine job, say the owners.

Here is exactly *WHY* the Concave Side Saves You Money in V-Belt Costs

When *any* V-belt bends in going around its pulley, it is forced to *change* its *shape.*

Naturally so, because the top of the belt is under tension and grows *narrower* while the body, under compression, *bulges out!*

This change of shape in a *straight-sided* V-Belt, is shown in figures 1 and 1-A—and you will note how the bulging sides press *unevenly* against the V-pulley.

Now look at figures 2 and 2-A. There you see how this change of shape, due to bending, affects the belt that is built with the Concave Side—the Gates Vulco Rope. The precisely engineered Concave Side exactly corrects the side-bulge—and the bent belt *has a shape that exactly fits its sheave groove!*

Two distinct savings result. *First*—There is no side-bulge to cause uneven wear. The sides press *evenly* against the V pulley and therefore wear *uniformily*—resulting in *longer life!* Second—The *full width* of the sidewall grips the pulley—thus carrying heavier loads without slippage—and this *saves belts* and also saves *power!*

When you buy V-Belts, be sure you get the V-Belt with the Concave Sides... the Gates Vulco Rope!

What Happens When a V-Belt Bends

Straight-Sided V-Belt

How Straight Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear at Point Shown By Arrows.

Gates Vulco Rope with Concave Side

No Side Bulge. Precise Fit in Sheave Groove. Sides Press Evenly Against V-Pulley—Uniform Wear—Longer Life!

CS-505

THE GATES RUBBER COMPANY
DENVER, U.S.A.
The World's Largest Makers of V-Belts

GATES VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

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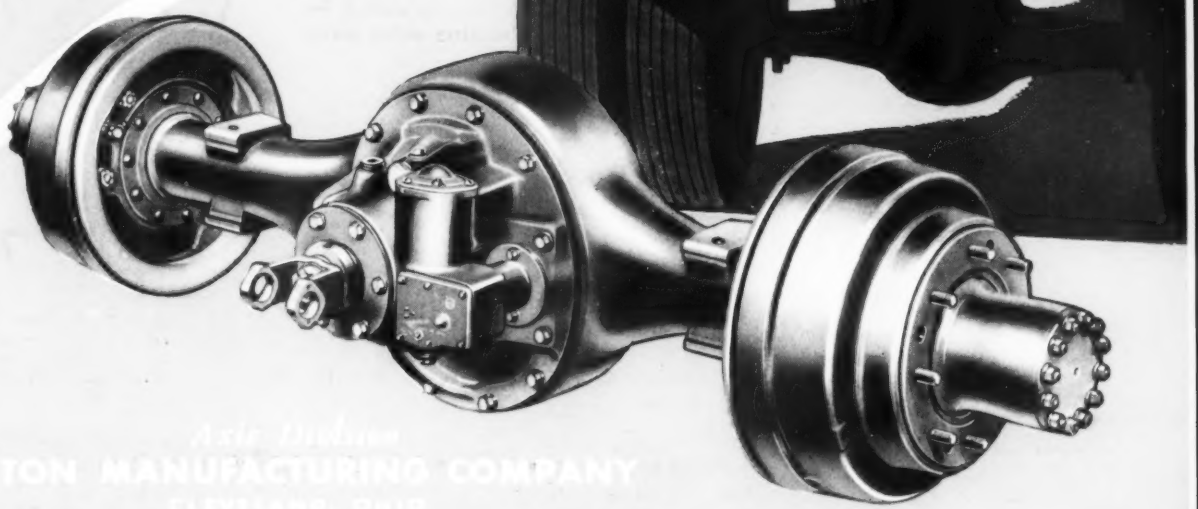
Even at slowest truck speeds—where gear tooth loads are often highest—Eaton's exclusive Forced-Flow Lubrication System provides positive protection for vital axle parts. With less than one revolution of the axle drive gear, oil begins to flow to all moving axle parts. As speed increases, flow is accelerated to meet the demand. This means reduced friction and wear, longer axle life and lower upkeep cost. Eaton 2-Speed Axles are available for most trucks of the 1½-ton class and larger. Ask your truck dealer for a road demonstration.

More Than a Million Eaton 2-Speed Axles in Trucks Today



Axle Division

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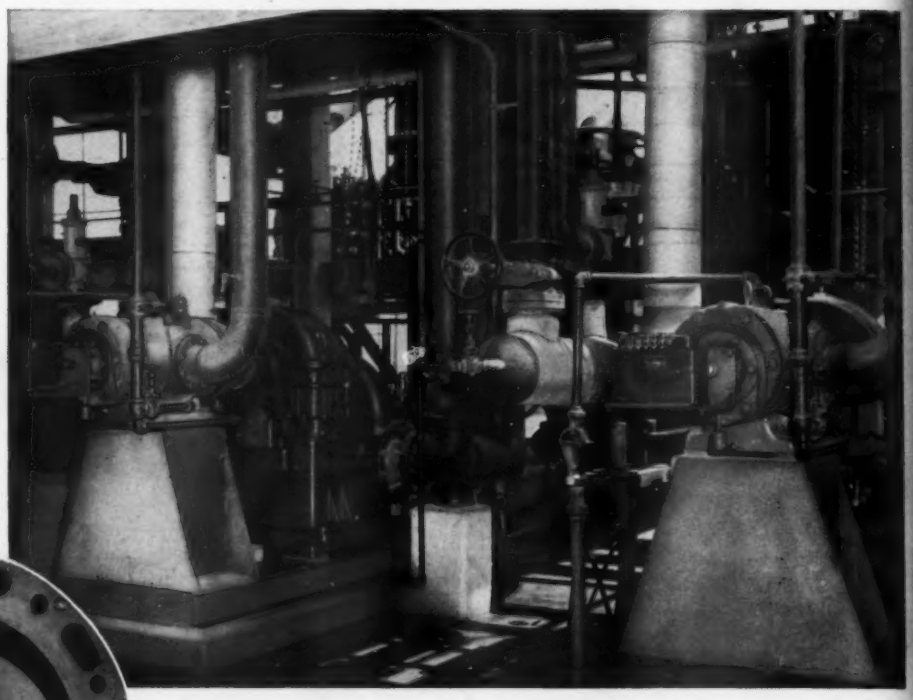
COMPRESSORS AND VACUUM PUMPS
FEEDERS, AND ASSOCIATED EQUIPMENT

sound lungs for industry



FULLER rotary compressors

Fuller Rotary Compressors are first choice for dependability in refineries of every size the country over. That's only natural, because Fuller engineers and builds for trouble-free, long-term, low-cost operation. Fuller Rotary Compressors have but few moving parts . . . rotor, bearings, and blades. They need little attention, infrequent inspection. Maintenance is low since there are no valves to leak or seats to grind, and blades automatically compensate for wear. *Full capacity is maintained for the life of the machine.*

It's this lifetime of new machine efficiency that makes them the logical, economical choice for general plant air, purging gas, for refrigeration in alkalization units, and for handling natural, manufactured, and various refinery gases. And they can't be beat as prime factors in reducing installation as well as operating costs.

A Fuller engineer will be glad to show you how Fuller Rotary Compressors can go on your payroll at the minimum wage. Get in touch with him today . . . or write for Bulletin C-5 which describes Fuller Rotary Compressors in detail.

C-200

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with **POSITIVE RELEASE**

Air-Tite

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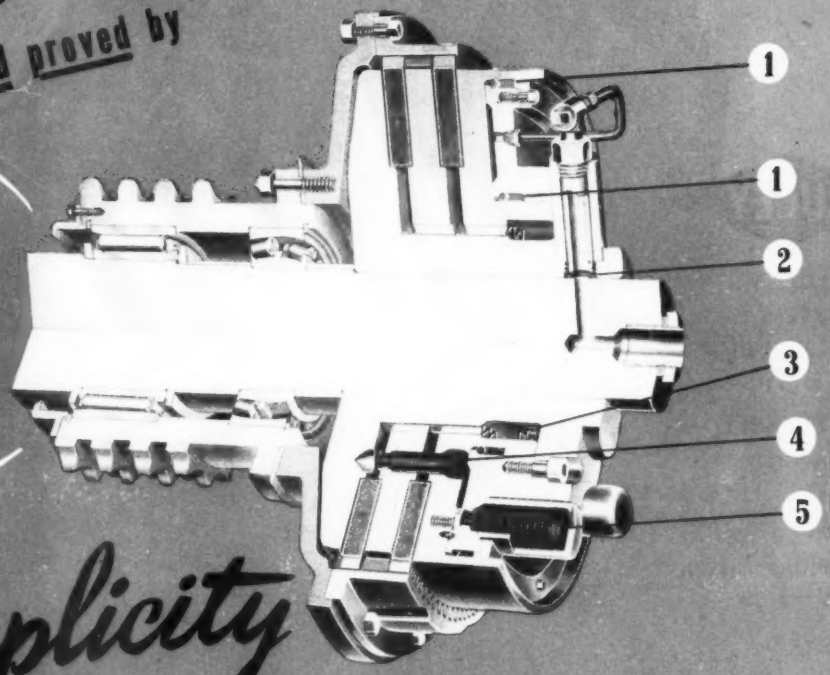
6 years' drilling service

Field proved by



100% performance on pump drives

Simplicity

Ideco Air-Tite Clutches have only one actuating part. Engagement is made smoothly without double clutching. Positive separation of all friction elements permits blocks to fall freely . . . eliminates wear when idling. No adjustment is ever required as the Ideco Air-Tite Clutch is self-compensating for wear. Rugged heavy-duty construction assures long service-free operation.

COMPARE THESE FEATURES:

1. **Double External Air-Tite Packing** — *"O" Ring and "V" Packing can be replaced quickly in the field with clutch in place.*
2. **Sealed Air Take-Off** — *A permanent air seal between shaft and hub.*
3. **Full Complement of Teeth** — *Has 360 full contact.*
4. **Patented Release Pins** — *Provides a positive separation between floating plate and friction plates.*
5. **External Release Springs** — *Releasing action is quick and positive, unaffected by heat, corrosion or centrifugal force. This design provides high clutch capacity within a small diameter.*

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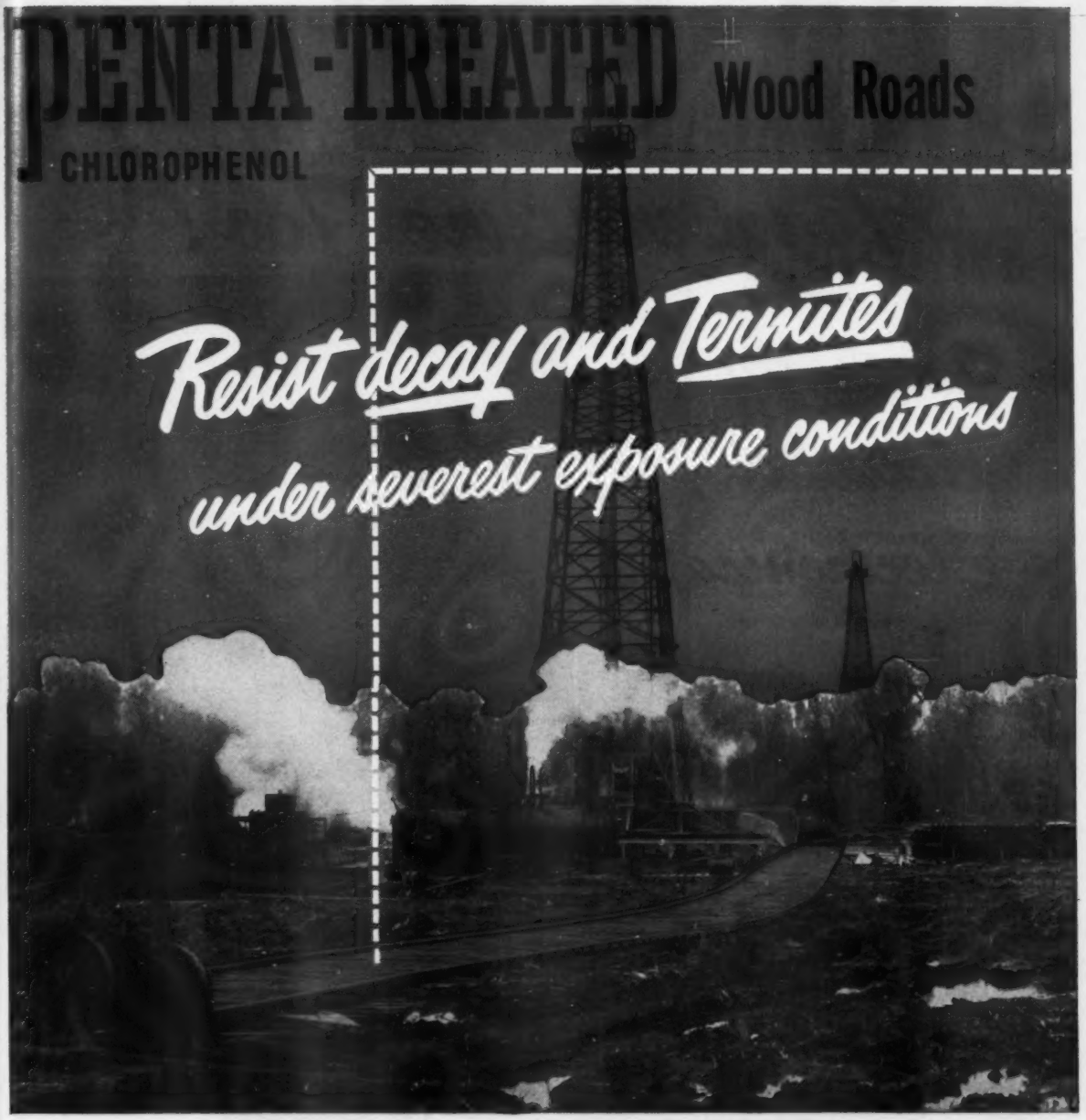

PENTAchlorophenol is a *tested* wood preservative. In Louisiana, "PENTA"-treated posts were placed in swamp-like ground and *after twelve years' exposure* were removed in excellent condition. Untreated posts placed beside them failed within two and three years.

"PENTA" is a *clean* preservative . . . protects wood against decay and termites . . . gives wood greater salvage value. "PENTA"-protected lumber lasts years longer than untreated wood!

Reduce maintenance costs and give your wood roads, sheds and other structures added durability—ask for "PENTA"-protected lumber. For more information about PENTAchlorophenol write Dow, Dept. PE 49-B.

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Temperature Too!

- *Instantly*
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These Features Save You Money	For These Reasons	It's a Worthington—
1 Two-piece QD sheave—rim and hub separate	Mount light hub first, then slide heavier rim on tapered hub	EXCLUSIVE
2 Choice of one or two-piece assembly	Mount hub and rim separately, or loosely assemble hub on rim and slide on shaft together	EXCLUSIVE
3 Split hub	Easy to mount, even on oversized shaft	ORIGINAL
4 Clamp screw in hub	Holds hub in position on shaft while setting or removing rim	EXCLUSIVE
5 Taper-mated hub and rim	Mount easily in any position—no keyway between taper surfaces	ORIGINAL
6 Large, long pull-up bolts	Hold better and more uniformly	EXCLUSIVE
7 Friction cone grip	Tightening rim on hub gives positive press fit on shaft	ORIGINAL
8 Shaft key lock (set screw over keyway)	Prevents key from drifting	EXCLUSIVE
9 Quickly-detachable (QD)	Pull-up bolts used as jack screws to remove sheave rim	ORIGINAL
10 Interchangeable rims	Hubs for every bore—lower inventory cost	ORIGINAL
11 No realignment problem	Clamped hub holds shaft position—new rim tightens up in exact alignment	EXCLUSIVE
12 Choice of "A", "B", "C" and "D" grooves	"Tailor-made" grooves give proper belt "ride-out" for maximum life efficiency	ORIGINAL
13 I-beam spokes on driven sheave	Stronger—capable of carrying heavier load with less weight	EXCLUSIVE
14 Offset design of sheave	Reduces over-hang loads—increases bearing life	ORIGINAL
15 Worthington-Goodyear V-belts	Load-carrying cords in neutral axis reduce internal friction—each belt carries its share of drive load	ORIGINAL

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Here are 15 money-saving features of the most efficient V-belt drive. Only Worthington Multi-V-Drives give you all 15!

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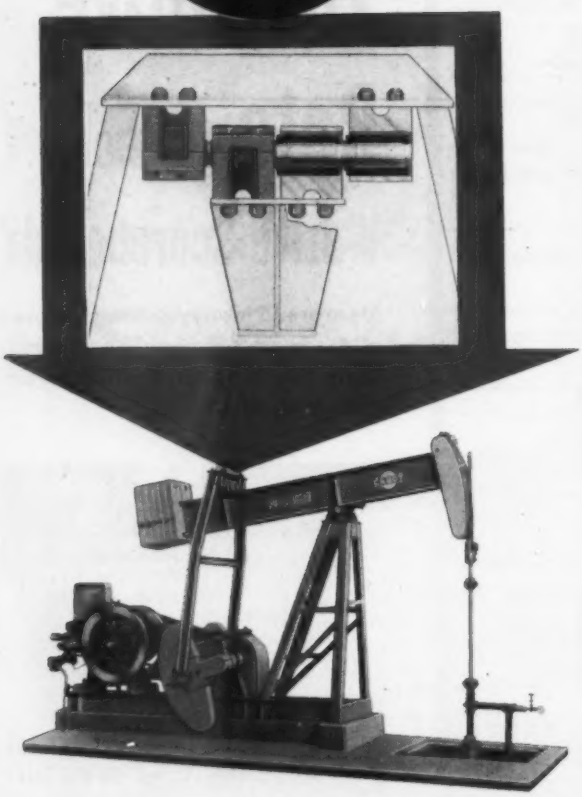

New Equalastic Bearing

- **Eliminates 62 Parts**
- **Requires No Maintenance**
- **Cushions Shock**
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Bearings that require maintenance and replacement; rubbing surfaces that waste power; shock and vibration that cause rod failure — all these headaches and sources of waste are eliminated by the new Cabot Equalastic Bearing.

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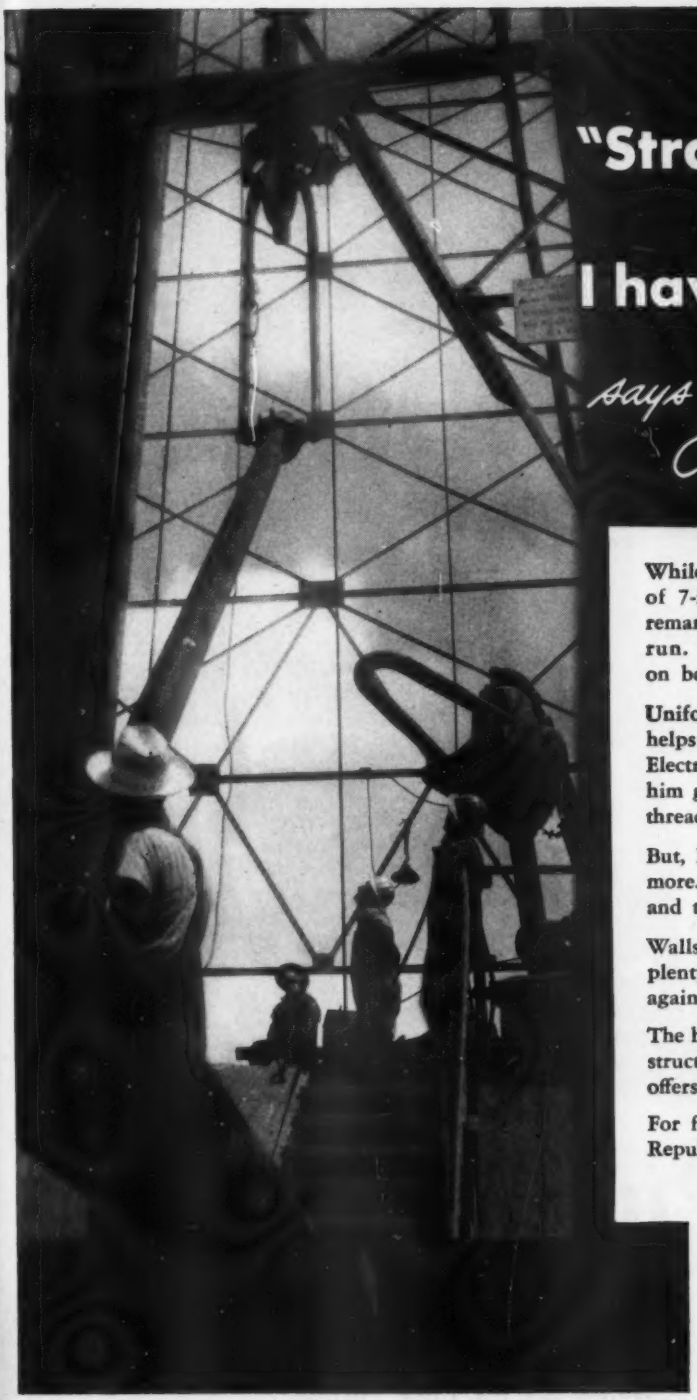

"Straightest string of casing I have ever run..."

says a California contractor

While this drilling contractor was running 7,051 feet of 7-inch J-55 Republic Electric Weld Casing, he remarked that this was the straightest string he'd ever run. In just nine hours, he not only had his string on bottom, but had cemented it in with 600 sacks.

Uniform straightness from end to end of every joint helps the man on the stabbing board keep Republic Electric Weld Casing right on the vertical . . . helps him guide it into stabbing position quickly . . . helps threads engage cleanly without galling or cross-threading.

But, Republic Electric Weld Casing offers you much more. Threads are clean and full-formed. They spin-in and tong-up fast . . . take hold with a bulldog grip.

Walls are uniformly round and uniformly thick, with plenty of tough steel under thread roots to protect against pullouts.

The high ductility steel is fully normalized for uniform structure and cold sized for high yield strength . . . offers top resistance to collapse.

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Republic Electric Weld Casing and Tubing are made from flat-rolled steel, both sides of which are inspected. Thus, the surface which becomes the inside wall is free from hidden defects.

REPUBLIC *Electric Weld* **NORMALIZED CASING AND TUBING**

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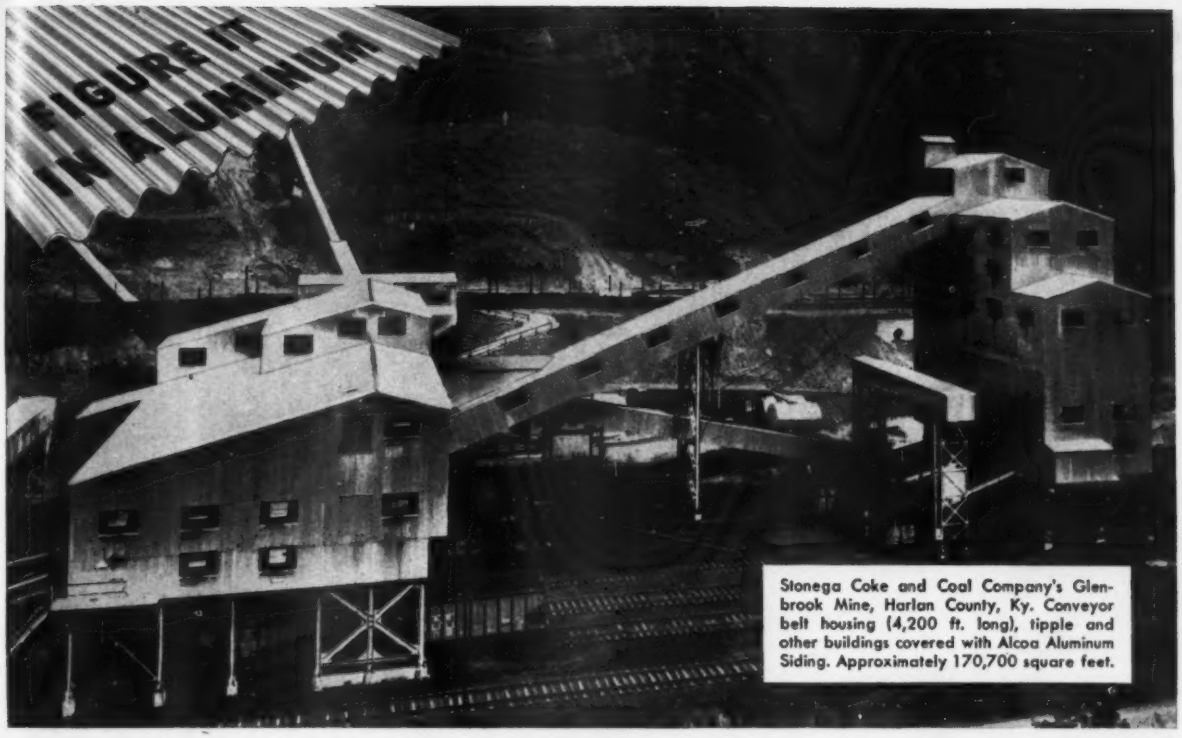

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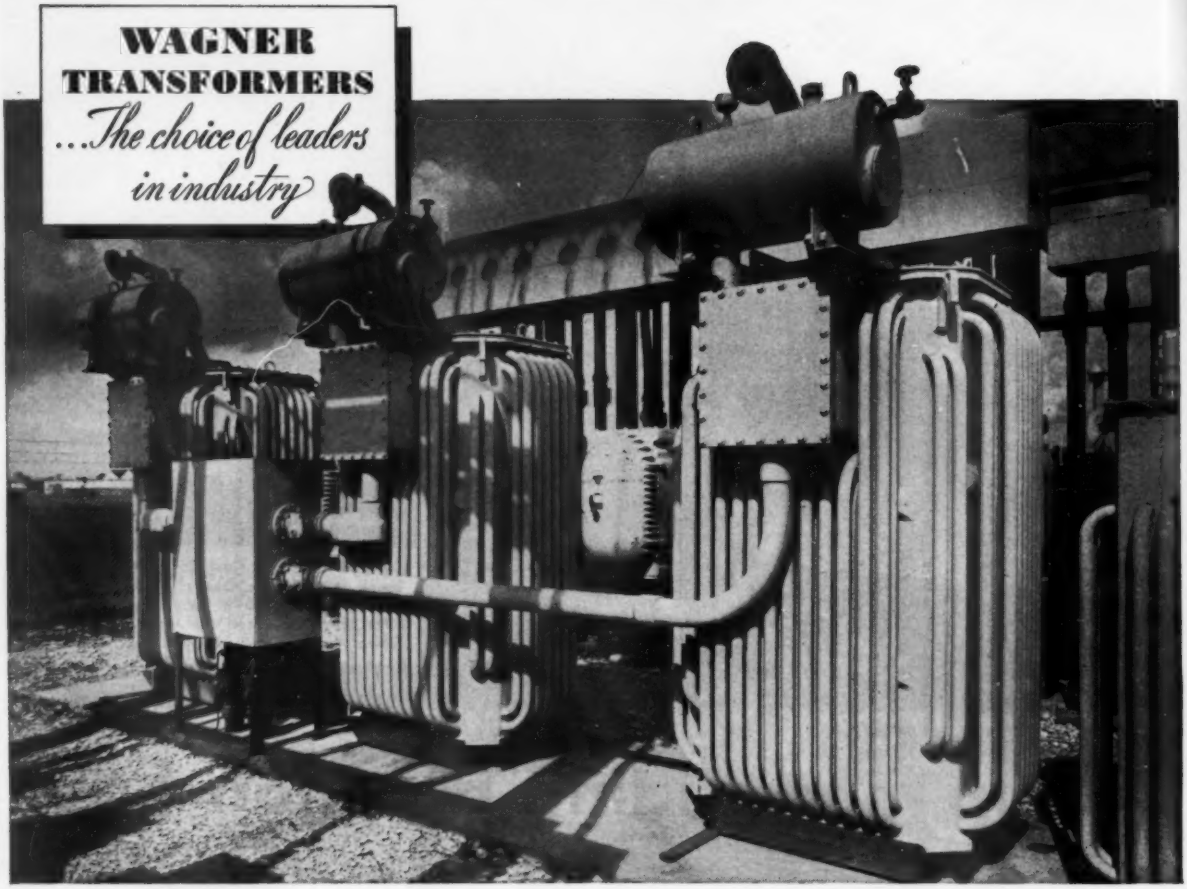

Bank of 667 kva, 1 phase, 60 cycle, 2400 to 480 volt Transformers

Wagner Transformers power the production of Rohm & Haas "Chemicals for Industry"

Production of "Chemicals for Industry" by the Rohm and Haas Company, makers of famed Plexiglas, is not a simple one-plant operation. The products of one of their plants may have no resemblance to the commercial products into which they are integrated at another plant. The natural raw material found in Texas, for instance—the processed chemicals manufactured there—and Plexiglas, an end product manufactured in another plant—are all part of a great modern production chain.

Power for production—with Rohm and Haas as with any modern industry—is provided by electricity. The manufacture of chemicals in the Rohm and Haas plant in Deer Park, Texas, is powered by Wagner Transformers and Wagner Motors. Wagner transformers in the main substation take energy at 69,000 volts and feed it to the low voltage substation at 2400 volts. The low voltage substation of Wagner transformers (illustrated above) in turn furnishes 480 volts to motors and to small air-cooled Wagner transformers which furnish 120 volts for lights and other single phase loads.

Thirty-one branch offices, located in principal cities, are ready to help you whenever you have a transformer problem. Users of Wagner Transformers also benefit by nationwide service facilities. Write for Bulletin TU-180 and TU-181 for full information on Wagner Power and Distribution Transformers.

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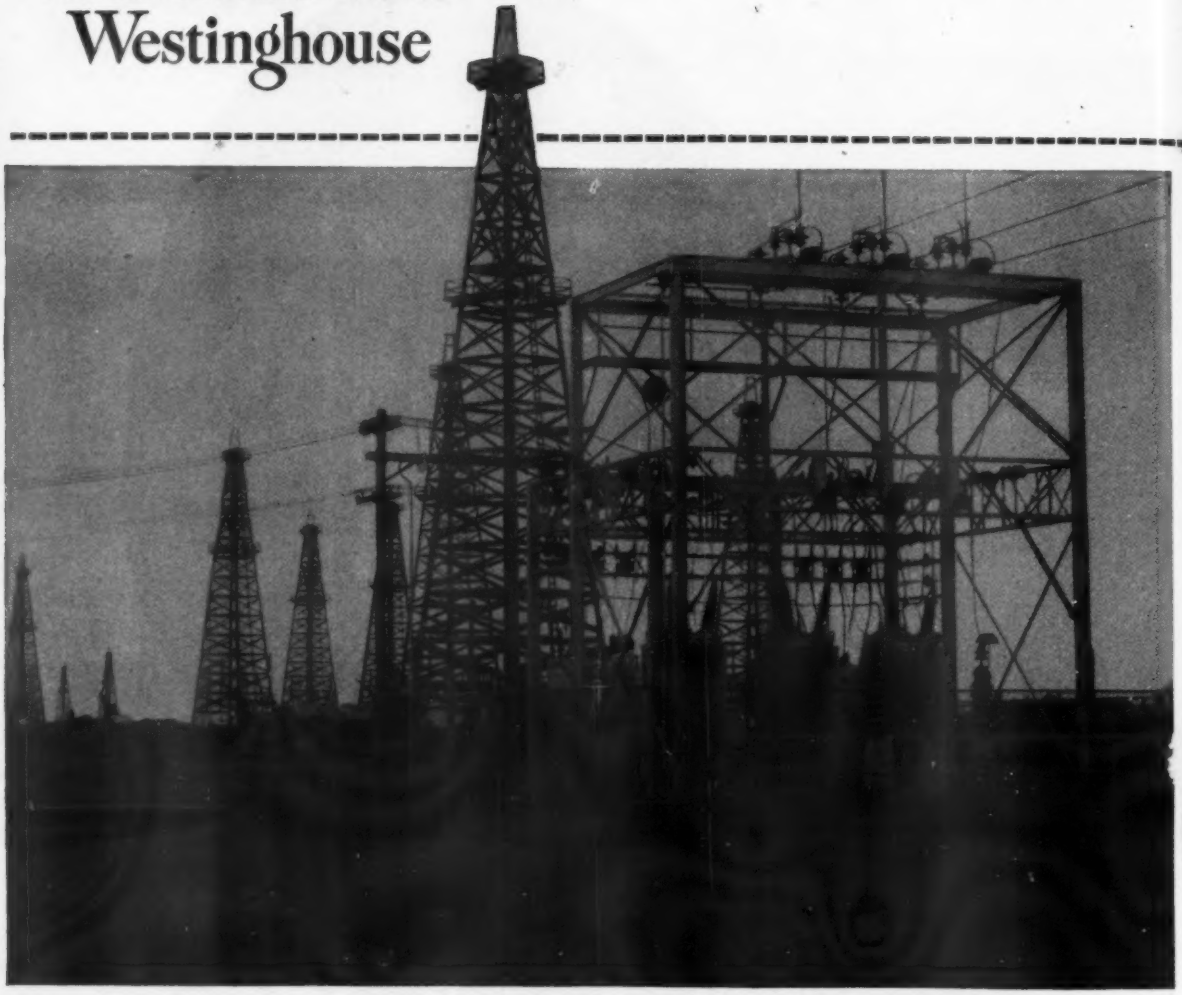

GET THIS HELPFUL HANDBOOK ON ELECTRIFIED PUMPING

Here are 48 pages of helpful facts on electrified pumping . . . authoritative information to help you answer such questions as: What size motors should I specify, which type? How about automatic time control? What's the best distribution system for my lease? And a hundred others. It's a typical indication of Westinghouse "know-how" in every phase of oilfield electrification.

If you haven't already received your copy, write for it now. Ask for B-4039. Address: Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Penna.

How much can *Electrified Pumping* save for YOU?

In one case on record, electrified pumping reduced lifting costs by *36 percent!* In another, it produced savings that completely offset power costs. In every case the savings have been substantial . . . a natural result of these cost-slashing advantages of electrification. *How much will they save for you?*

Lower maintenance costs—Fewer wearing parts mean less inspection . . . less servicing.

Less manpower required—Sure time-clock operation permits maintenance of efficient, intermittent pumping schedule without human attention.

All-weather operation—Sure starting and high efficiency regardless of the weather or age of the equipment: Trouble-free operation at low temperatures; no "freeze-ups" to cause downtime . . . lost production.

Lower installation costs—Only a minimum foundation required; no house needed for weatherproof motor and controls.

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For know-how . . . for dependable equipment . . . for undivided responsibility . . . come to Westinghouse and be *sure!* Call your nearest Westinghouse office or write Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.

J-94854

Westinghouse

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Announcing the NEW

JENKINS *SWINGTITE*

with an exclusive new design that assures smooth action, positive closure, and longer life

In the new Jenkins SWINGTITE Fast-Action Bronze Gate Valve, the exclusive rolling disc and guide track design lengthens valve life and assures maximum tightness as it prevents uneven wear of seating surfaces. As the valve is opened or closed, guide rims around the seating surfaces of discs roll freely over guide tracks cast in the body, distributing wear evenly, dislodging foreign matter, and providing a polishing action for seating surfaces.

The SWINGTITE can be opened or closed instantaneously and easily with less than a quarter turn of the malleable iron lever which activates the self-adjusting ball and socket type double disc.

Wherever full, free flow is essential . . . where valve opening or closing must be instantaneous . . . you will see more and more Jenkins SWINGTITE Bronze Gate Valves setting new standards of performance and endurance. They are recommended especially for such services as laundry machinery, dish-washing equipment, gasoline and fuel oil lines, fire extinguishing steam lines in kitchens, and dispensing lines to tanks or vats.

Get all the facts on the new Jenkins SWINGTITE. Find out how much smoother-operating, how much *longer-lasting* these fast-action Bronze Gate Valves can be when *Jenkins* builds them. Send for the new folder, Form No. 196, containing full details. Jenkins Bros., 100 Park Avenue, New York 17, N.Y. Jenkins Bros., Ltd., Montreal.

Sold through leading Industrial Distributors

NO OTHER VALVE of its type HAS THIS FEATURE

Notice the guide rims (A) of the discs which rotate freely on the guide tracks (B) cast in the body, as the valve opens or closes. This roller action provides a self-cleaning and polishing effect, and also distributes the wear, since the seating position of the discs changes with each closing. Rapid, uneven wear is prevented, and continuous tight closure assured.

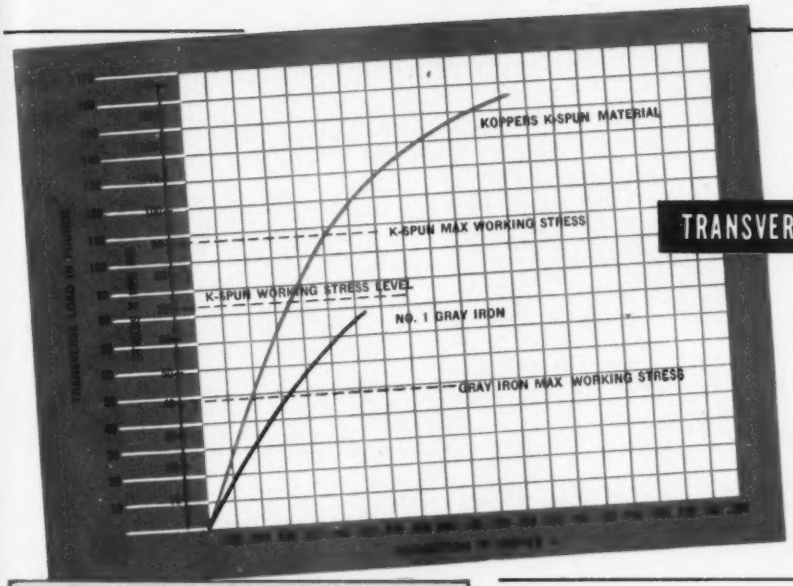
JENKINS VALVES

LOOK FOR THE DIAMOND MARK

SINCE 1864 TRADE JENKINS MARK

Jenkins Bros

Here's PROOF that Koppers K-Spun Piston Rings are TWICE AS STRONG!



HERE ARE THE AMAZING RESULTS OF ACTUAL LABORATORY TESTS COMPARING ORDINARY GRAY IRON WITH KOPPERS K-SPUN, *THE MIRACLE METAL!*

TRANSVERSE STRESS CHART

Koppers K-Spun material shows a maximum working stress of 90,000 psi, compared with a maximum working stress of *only 40,000 psi for ordinary gray iron piston ring material!* Note the difference in the slopes of the two curves, due to K-Spun's increased modulus. K-Spun's yield point, though approaching ultimate strength, is low enough to allow a small percentage of elongation, resulting in toughness and impact value *many times greater* than that of ordinary gray iron.

TABLE 1—TRANSVERSE MODULUS AND RUPTURE STRESS

Koppers K-Spun Material			No. 1 Gray Iron		
TRANSVERSE MODULUS at			TRANSVERSE MODULUS at		
40,000 # psi	60,000 # psi	90,000 # psi	40,000 # psi	60,000 # psi	90,000 # psi
22.0×10^6	20.6×10^6	18.6×10^6	12.4×10^6	10.8×10^6	.....
RUPTURE STRESS psi			RUPTURE STRESS psi		
130,000			67,000		

TABLE 2—HARDNESS, IMPACT AND TENSILE STRENGTH

Koppers K-Spun Material			No. 1 Gray Iron		
Hardness Rb	Impact in lbs.	Tensile Stren., psi	Hardness Rb	Impact in lbs.	Tensile Stren., psi
100-103	9.5- 9.5	75,400	102-104	2.5-3.0	42,000
99-100	11.0-11.5	72,900	103-104	2.5-3.0	40,000
105-106	7.0- 5.0	76,000	101-103	3.0-3.0	41,000
99-102	7.0- 8.0	78,100	103-105	2.5-3.0	42,000
98-100	8.5-10.0	76,500	104-105	3.0-3.0	42,300
103-104	6.0- 7.0	77,500	102-103	3.5-3.5	38,000
101-102	7.0- 8.5	78,000	104-105	2.5-2.5	40,000

IF you've had experience with Koppers American Hammered Rings in Diesel, steam or gasoline engines, you already have *proof of performance* of their superiority . . . now read for yourself these scientific facts and figures, verified by exhaustive laboratory tests . . . *positive proof that K-Spun Rings are 100% stronger, 50% more elastic, four times more shock resistant than ordinary ring material!* They're *guaranteed* not to break in installation or in service! Get the facts on Koppers Piston Rings today . . . write for complete information to: KOPPERS CO., INC., *Piston Ring Dept.*, 1556 Hamburg Street, Baltimore 3, Maryland.

K-SPUN IS AN ENTIRELY NEW, STRONGER KIND OF CAST IRON

ORDINARY CAST IRON

KOPPERS K-SPUN

These microstructures, magnified 250 times, show the basic difference between ordinary cast iron and Koppers K-Spun. Top photo shows individually cast gray iron, containing spiral flake graphite with long stringers in a fine pearlitic matrix. This fine flake graphite imparts to the metal many planes of weakness, causing low resistance to combustion shock.

Bottom photo shows K-Spun, cast by an exclusive centrifugal process. Note large nodular type of graphite formation and absence of stringers. Large graphite nodules eliminate the many planes of weakness inherent in most cast iron . . . double impact resistance and elasticity . . . increases wear resistance by far . . . in amazing Koppers K-Spun Piston Rings!

POROUS CHROME PISTON RINGS
. . . another Koppers Exclusive!

Koppers Porous Chrome Rings reduce cylinder wall wear 50% or more by actual test! Famous Van der Horst Plating Process provides a porous chrome surface that distributes oil for better lubrication during break-in, wears down to perfectly seated solid chrome that gives up to *four times as much service* between overhauls! For gasoline and Diesel engines (on specification).

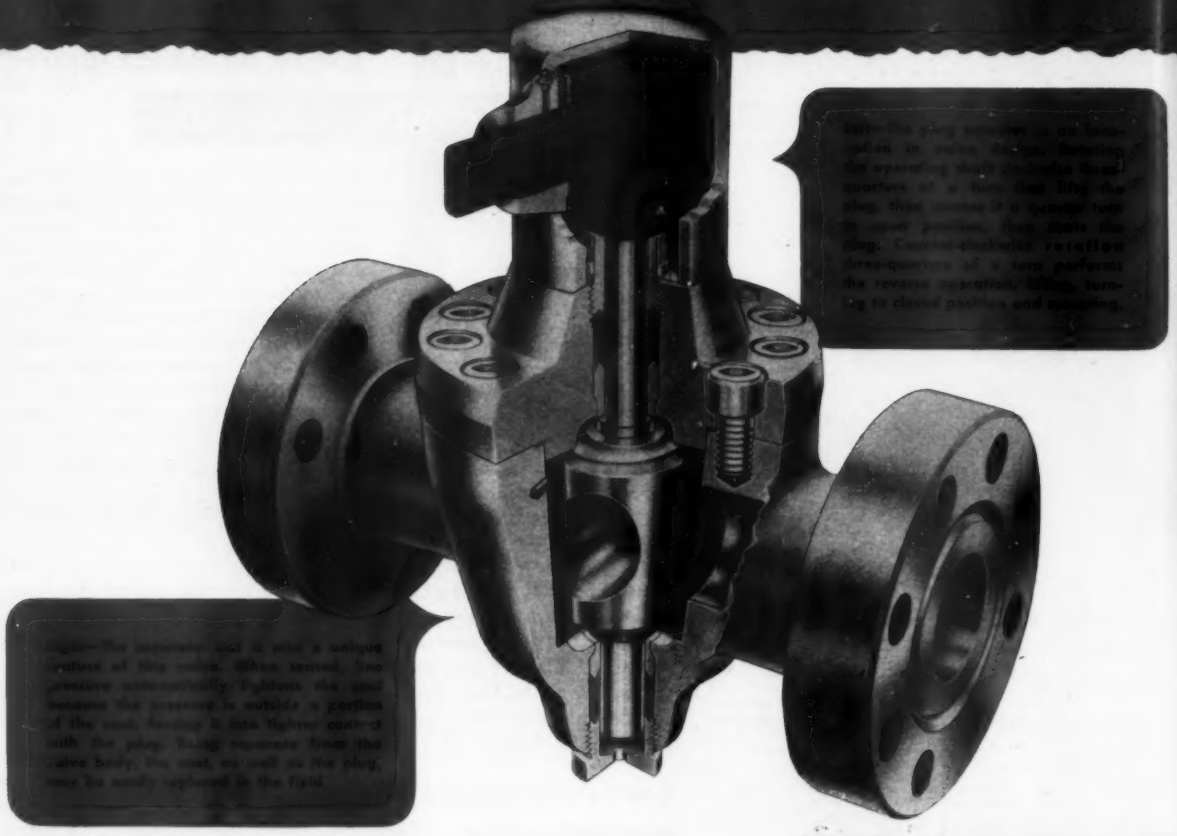
KOPPERS

KOPPERS *American Hammered* PISTON RINGS

THE NEW *Cameron* NON-LUBRICATED

LIFT-PLUG VALVE

... a revolutionary approach to improved valve design!



The Cameron Non-Lubricated Type "LP" (Lift-Plug) Valve presents a revolutionary approach to the problem of quality valve design. It combines the advantages of recognized plug, gate, and globe valves, and eliminates the generally recognized difficulties of the standard valve designs.

Need for lubrication, which is essential to the operation of the usual plug valve, and generally accepted as an improvement in gate valve design, is eliminated in the "LP" Valve for two reasons: First a complete seal is effected when the valve is shut, because a portion of the exterior surface of the removable seat is exposed to pressure, thus permitting a pressure sealing action and secondly, the plug is lifted straight away from the seat before rotation to prevent scoring or galling of the seating surfaces. In addition to eliminating the need for lubrication, the pressure sealing action of the seat and plug forestalls many of the difficulties experienced with conventional designs in all types of valves where distortion of the body due to pressure, temperature, or line strains ordinarily cause imperfect sealing.

The lift and turn mechanism incorporated in the valve not only act to eliminate the need for lubrication but makes possible an extraordinary ease of operation, since operating effort goes first into lifting the plug straight off the seat, then into turning it while free from contact with the seat, and, finally, reseating without rotation.

In all pressure ranges, the plug rotates in accurately aligned bushings to effectively prevent contact during rotation of the sealing surfaces. Since the seat is a separate piece, which may be removed from the body, it is perfectly feasible to replace both the seat and plug in the field under ordinary conditions. The separate seat and plug are normally furnished in corrosion resistant materials, and may be supplied from almost any material as required for unusual corrosive or erosive service.

THE BEST FEATURES OF PLUG AND GATE VALVES COMBINED WITH NEW CAMERON INNOVATIONS.

- NON-LUBRICATED—no grease of any kind required to effect a seal; also reduces chance for human error and need for maintenance.
- PRESSURE SEALING—when plug is seated, line pressure automatically forces seat into tighter engagement with plug.
- UNIQUE LIFT-PLUG ACTUATOR—a novel mechanical design which lifts, turns and reseats plug in continuous turn of a lever.
- RENEWABLE SEAT AND PLUG—permits any desired trim.
- FIELD REPAIR—can be completely overhauled without removal from line; no special tools or skill required.
- EASY OPERATION—requires less operating effort than other valve designs.
- FORGED STEEL—All parts, including body, are press or drop forged from specification materials.

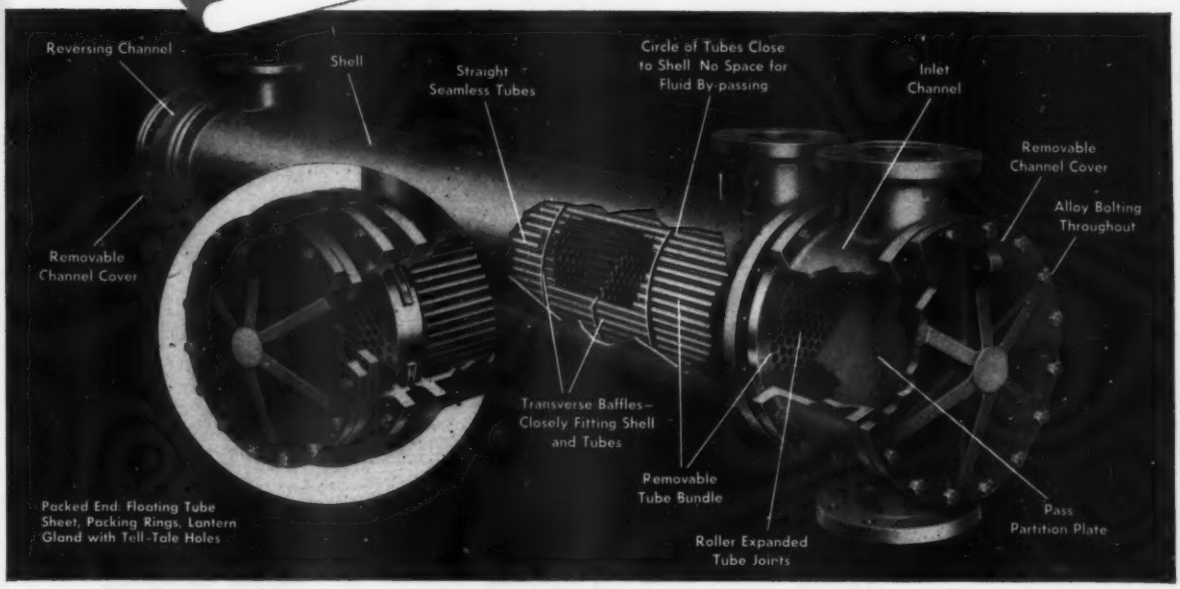
Cameron

IRON WORKS, INC.

P. O. BOX 1212 HOUSTON, TEXAS

Export: 74 Trinity Place, New York, N. Y.

now a smaller exchanger to handle a larger volume


Reversing Channel
Shell
Straight Seamless Tubes
Circle of Tubes Close to Shell No Space for Fluid By-passing
Inlet Channel
Removable Channel Cover
Alloy Bolting Throughout
Removable Channel Cover
Transverse Baffles—Closely Fitting Shell and Tubes
Removable Tube Bundle
Packed End: Floating Tube Sheet, Packing Rings, Lantern Gland with Tell-Tale Holes
Roller Expanded Tube Joints
Pass Partition Plate

Ross Research Reduces Size-Cost Requirements For Many Installations

For years, one of industry's most widely used, removable bundle exchangers, Ross Type CP now offers still more heat transfer capacity without increase in size.

As a result, it is possible in many instances for a smaller, less costly exchanger to handle a volume formerly calling for a larger unit.

MORE TRANSFER SURFACE — INCREASED TRANSFER RATE

A new tube layout, incorporating an added circle of tubes close to the shell (in the space so frequently left open in conventional designs) not only increases surface, but improves flow characteristics. Moreover, new techniques achieve closest possible clearances with utmost accuracy and uniformity, adding substantially to heat transfer rate.

LOW FIRST COST — QUICK DELIVERY

Add savings in space and cost, to the already well known benefits of low purchase price and quick delivery made possible through standardization and stocking of parts, and it's easy to see why Ross Type CP, now more than ever, is industry's leading removable tube bundle type exchanger.

FREE CATALOG

Get details on these and other famous Ross features such as easy-to-clean, straight tube design . . . wide latitude of connection locations . . . ease of installation . . . in new file-size Bulletin 2.1K1. Write.

ROSS HEATER & MFG. CO., INC., Div. of American Radiator & Standard Sanitary Corp., 1417 West Ave., Buffalo 13, N. Y. In Canada, Horton Steel Works, Limited, Fort Erie, Ont.

ROSS

EXCHANGERS

Serving home and industry

AMERICAN STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON

XUM

You get better products

Jobs are born

Money spreads and people prosper

Three things happen when earnings go to work

There has been a growing need in the West for wax . . . the kind used on milk cartons, bread wrappers and containers of other foods and drugs you buy.

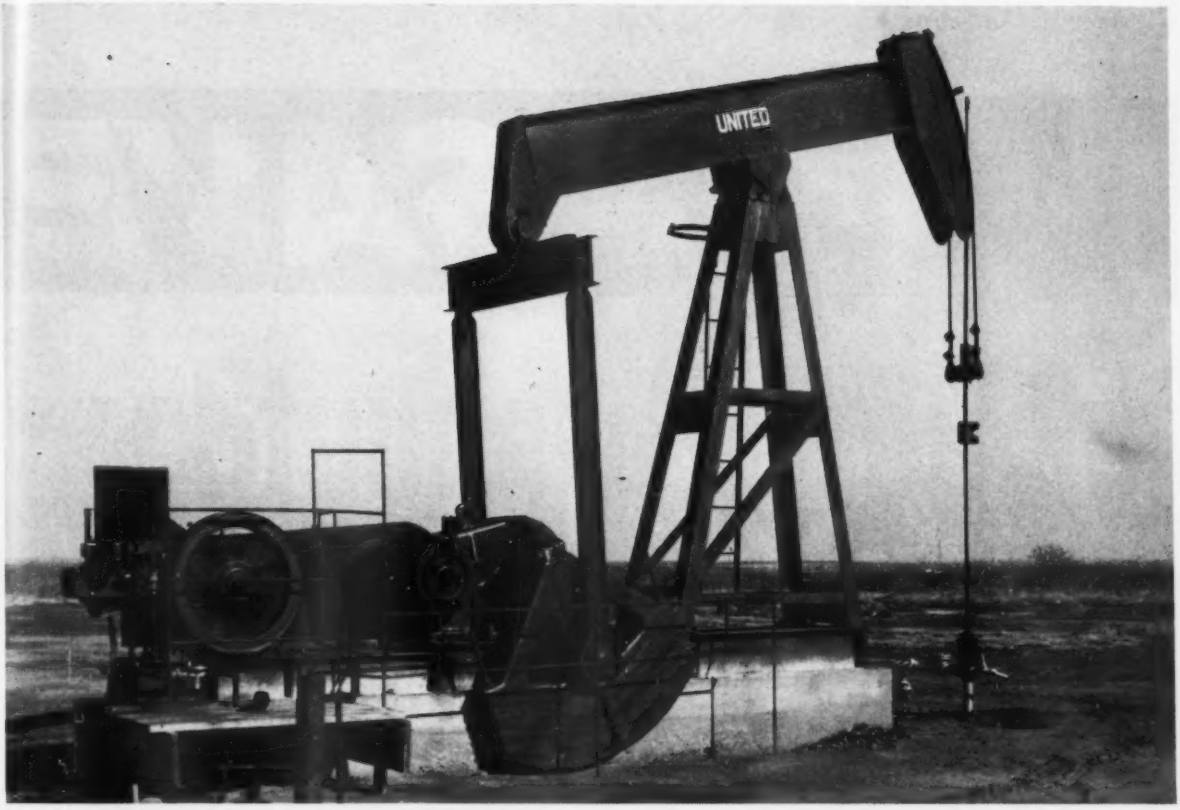
To fill this need, Standard of California recently completed a plant which refines excellent wax from petroleum. The plant cost $3,500,000; the money came out of earnings—or profits—and here's what it meant to you:

Better protected and packaged products, of course. More jobs for construction workers in building the plant; steady employment for the men who work in it today. More sales for small businesses because the money paid to the workers involved has naturally spread to the grocer, the department store, the doctor and every other business and profession.

This is one example—a 3½ million dollar example—of how earnings are put to work and keep our economy running. There are many others, for Standard of California has spent more than $500,000,000 just since the war for plants and facilities to serve you better.

STANDARD OIL COMPANY OF CALIFORNIA

plans ahead to serve you better



"You can't beat a United Unit for economy and long life"—Uncle Sandy

Courtesy
Service
Dependability

Superior design makes United Pumping Units best for every pumping job. All working parts in gear box are oil bath lubricated, and each bearing is flooded with oil wiped from side of intermediate gear.

Each bearing is equipped with an oil reservoir for immediate lubrication upon starting. Gear box has no natural pockets that are inaccessible to cleaning.

Settling chamber can be drained separately . . . saves time and money. External clam shell brake is independent of sheave.

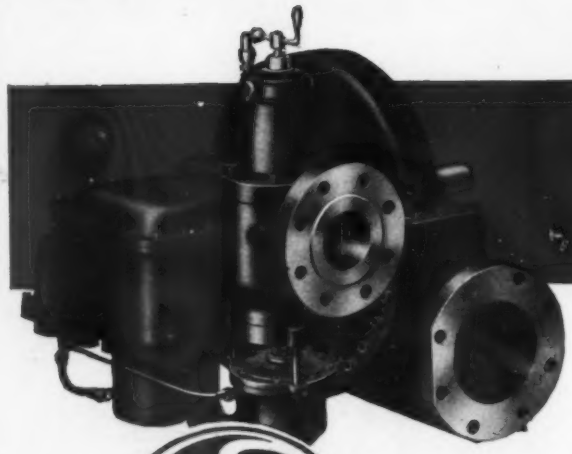
Center bearing assembly lubricated with oil bath . . . natural inherent reservoir . . . does not depend on oil seal. Crank-pin bearings . . . double row self-aligning roller bearings.

Torque rating well over API classification. Rugged construction and oversize bearings to handle unforeseen overload. Competitive price. These are reasons your United Pumping Unit will fit your pumping requirement.

UNITED SUPPLY AND *Manufacturing* COMPANY

TULSA, OKLAHOMA

Stores in Kansas, Oklahoma, Texas, Louisiana, and New Mexico



SAVE

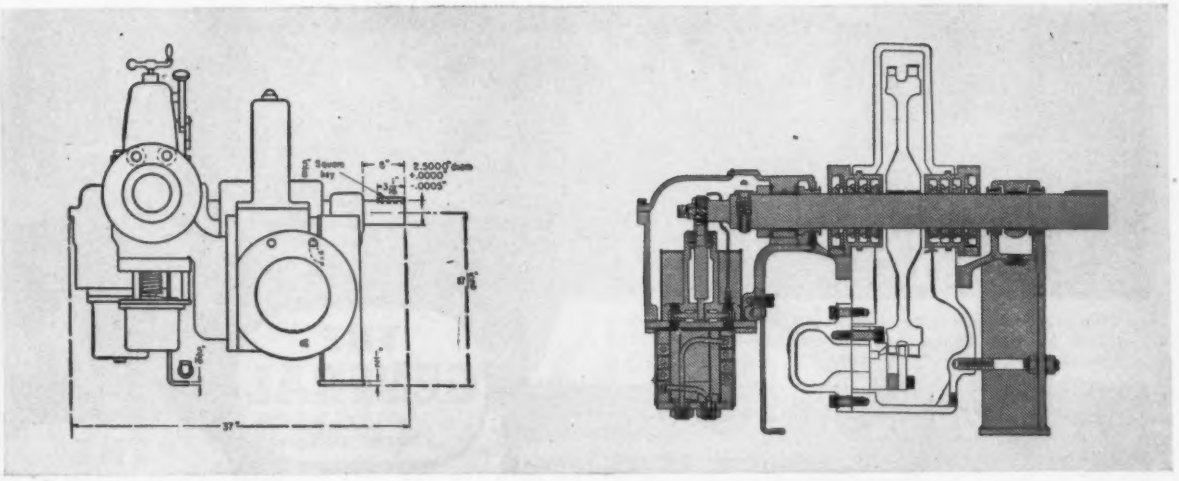
TYPE DP

General Electric's DP turbines, available in three frame sizes and a variety of ratings, can be profitably used in many different applications, yet they compose a standard line and incorporate standard parts. This standardization gives you four important benefits:

1 EASY TO STOCK SPARES Because most parts are interchangeable on all models, spares can be stocked at low cost. A spare parts kit, containing 91 items, can be obtained with the turbine. This simple method of stocking spares lowers maintenance costs and provides protection for several DP's in your plant.

FOUR WAYS

WITH Standard Turbines



2 INSTALLATION SIMPLIFIED

All models, regardless of frame size, horsepower, or speed ratings, have identical shaft height, keyways, and coupling fits. Thus, installation problems are simplified, and you can move these center-line supported units from job to job without a "custom line-up."

3 GREATER FLEXIBILITY

As the shaded parts in the diagram illustrate, most DP parts are identical on all frame sizes and ratings. In this way, you can adapt a DP for different job requirements with only minor changes. A different nozzle plate gives you a different horsepower output. A change in governor gears provides a new speed range. When modernization programs demand a change in plant operation, the DP's flexibility will save you money.

4 A BETTER TURBINE

Manufacturing savings from standardization are passed on to you in the form of special features at no extra cost. For instance: hydraulic governing, combined trip-throttle valve, 30% speed range are advantages you'd expect to find only in custom equipment.

Ask your General Electric representative for full details about the DP mechanical-drive turbine or write for bulletin GEA-4955. Get the full details on how standardization will benefit your plant operation. Apparatus Department, General Electric Company, Schenectady 5, N. Y.

GENERAL ELECTRIC

252-45

Building Pipelines . . . Transporting Power Units . . .
Moving Tank Cars— GENERAL
GETS ALL JOBS DONE
FASTER! SAFER! CHEAPER!

Off-the-road jobs require the extra strength and traction the General L. C. M. gives. No slipping, sliding, spinning. Massive lugs of rubber form a self-cleaning, open-center tread.

Over-the-highway, the General H. C. T.'s broad, free-rolling tread ribs put more rubber on the road for more safety, even wear, quicker stops on dry or wet pavement.

When jobs call for off and on-the-road work you can make more profit on General's dual-purpose team. The General L. C. M. gives you more traction, more flotation, more strength and wear for most work off-the-road. The General H. C. T.'s deep, saw-tooth, free-rolling tread ribs run safely at high speed over-the-highway. More rubber for more original miles. More carcass strength for more recap miles.

SPECIFY GENERAL TIRES ON YOUR NEW EQUIPMENT

Guaranteed Yield

100 BARRELS OF MUD PER TON OF CLAY

Drillers in South America, Arabia, Canada, Mid-Continent, Gulf Coast, California, in short, the world over, use Wyo-Jel for keeping mud fluid. They like the fine particle size, the excellent suspending qualities and ease of mixing.

Wyo-Jel absorbs tremendous quantities of water and has a guaranteed yield of 100 barrels of mud per ton of clay, at 15 Centipoise Viscosity, with minimum water loss.

Use Wyo-Jel, the ideal drilling mud material . . . a pure Wyoming Bentonite.

The Ideal Drilling Mud Material

WYO-JEL

THE WYODAK CHEMICAL DIVISION
of THE FEDERAL FOUNDRY SUPPLY COMPANY
4600 East 71st St., Cleveland 5, Ohio

THE WYODAK CHEMICAL DIVISION
4599 Pacific Blvd., Los Angeles (Vernon), Calif.

EXPORT REPRESENTATIVE
HOLLAND W. SMITH, 43 E. 43rd St., New York 17, N. Y.

NUMBER 1 OF A SERIES

SKELLY

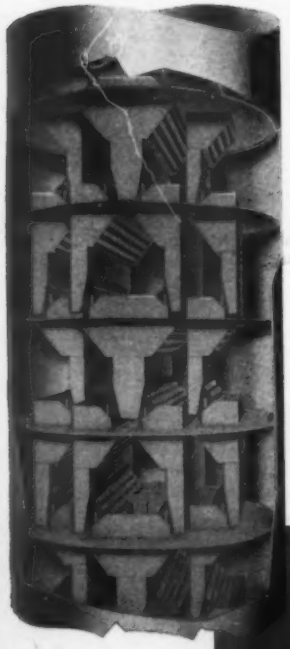
Another.....

satisfied user of

KOCH KASKADE
FRACTIONATING TRAYS

During the past two years, Skelly Oil Company has installed 12 towers with Koch Kaskade fractionating trays. These towers are in service as absorbers, rich oil strippers, a deethanizer, a debutanizer, a reabsorber and close-cut solvent fractionators. Koch Kaskade trays replaced conventional bubble trays in three of these installations.

Skelly's experience with Koch Kaskade trays has proved you, too, can save money in new installations and in replacing overloaded bubble trays. Write for our Bulletin No. 325, *no obligation.*



NOW IT'S **13**

Another installation of Koch Kaskade trays has been ordered to replace existing bubble trays.

THE KOCH ENGINEERING COMPANY, INC.

Designers — Manufacturers — Builders

335 WEST LEWIS STREET — WICHITA 2, KANSAS

EASTERN AND EXPORT
30 ROCKEFELLER PLAZA
NEW YORK CITY

PITTSBURGH, PA., REPR.
D. D. FOSTER CO.
412 PEOPLES GAS BLDG.

BRITISH ASSOCIATES
MESSRS. A. F. CRAIG & CO., LTD.
PAISLEY, SCOTLAND

They Say—

Government Management

"Many of these (congressional) measures are aimed for greater and greater control of the energy economy of the nation. It must be remembered that government management of the industry means 'political management' and will be detrimental to the public interest."

J. E. Warren, president, Independent Petroleum Association of America, address before Panhandle Producers and Royalty Owners Association, Amarillo, Tex.

Idea in Reverse

"The strange idea that the Government should support the people instead of the reverse is an ideology which leads to stagnation and ultimate ruin.

"An idea has taken root in the minds of millions of Americans that the responsibility for providing economic security should be shifted from the individual to the federal Government.

"Our attitude and reaction to this security problem will have a major influence on the character and destiny of our nation and people."

Frank Carlson, governor of Kansas, addressing Kansas City Oil Men's Club.

Overbuilt Highways?

"Federal agencies have greatly overestimated the cost and advocated policies of highway expansion programs, not only far beyond the actual needs and the ability of the taxpayers to pay, but beyond the ability of the road contractors to construct. Proposed federal highway expansion policies have exceeded the limits of good judgment and have jumped clear over the fence into fields of fantastic illusions."

The Hoosier Independent, Indiana Independent Petroleum Association.

Keeping the Price Down

"Today, gasoline sells (tax excluded) for about a nickel a gallon less than its price of 30 years ago when the widespread use of cracking by the industry began.

"Of course, the tax on gasoline somewhat more than cancels out the saving. Gasoline taxes (national average) have increased from less than a tenth of a cent a gallon in 1920 to the six and four-tenth cents a gallon that motorists pay today.

"If, instead of decreasing in price, gasoline had increased in price, many reasons could have been given. The

Snap-on Roughneck Set

A Special Oil Field Tool Kit

131 TOOLS

Here's What You Get:

MIDGET SET, 1/4" Square Drive
4 handles, 2 extensions
3 Sq. Sockets, 1/4" to 3/8"
8 Hex. Sockets, 3/16" to 7/16"
MASTER SET, 1 2" Square Drive
4 handles, 3 extensions
15 Hex. Sockets in tray. 7/16" to 1-1/4"
HEAVY DUTY SET, 3/4" Sq. Drive
7 Handles and extensions
12 Double broach Hex. Sockets 1-5/16" to 2-1/8"
11 BOXOCKET WRENCHES (double offset)
Sizes 7/16" to 1-5/8"
5 OPEN END WRENCHES (double end)
Sizes 25/32" to 1-1/2"
8 COMBINATION WRENCHES (short handle)
Sizes 5/16" to 3/4"
7 COMBINATION WRENCHES (long handle)
Sizes 13/16" to 1-1/4"
MISCELLANEOUS WRENCHES
2 adjustables, 2 pipe wrenches
1 vise-grip, 7 Hex. Head Wrenches 5/16" to 3/4"
3 PLIERS
Cutter, Heavy Duty, Lineman
2 BALL PIEN HAMMERS
12 oz. and 2-1/2 pound
SCREW DRIVERS
4", 8", 18" blades
9-1/2" screw starter
PUNCHES AND CHISELS
3 starter punches, 4 flat chisels
FILES
2 Mill Bastards, 1 Half Round Bastard
2 Round Bastards, 5 file handles
MISCELLANEOUS
Tinner Snips, Steel Tape Rule
16" Pry Bar, Tool Chest, Tote Tray
Hack Saw Frame—10 blades

... personally selected by oil field men for all types of service, repair, and maintenance work.

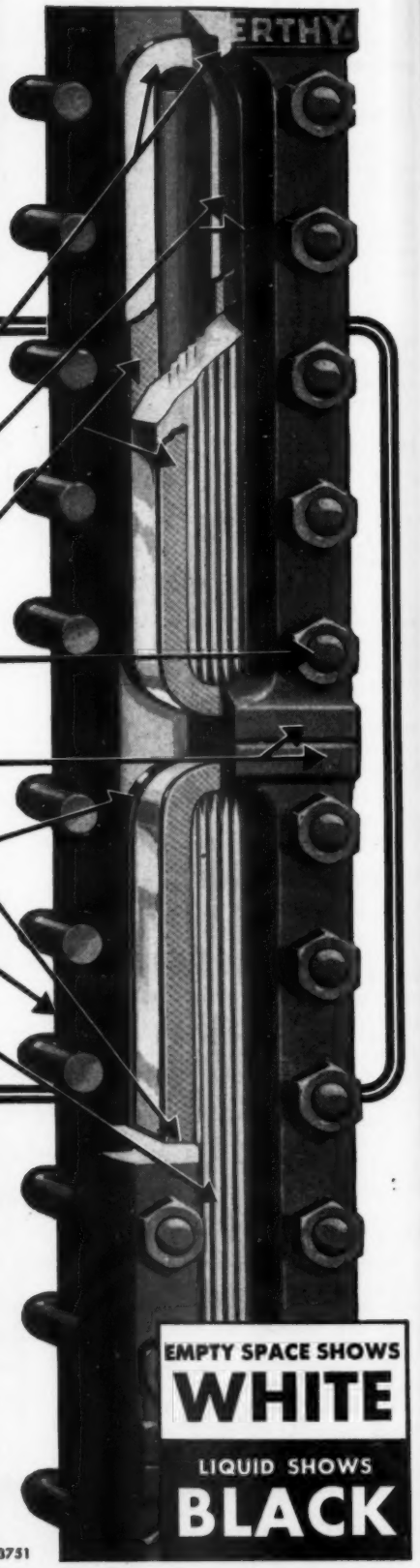
Having correct and adequate wrench equipment immediately available is valuable insurance against loss of time resulting from breakdowns on the job . . . and this "Roughneck Set" provides that insurance.

Here in one complete kit of tools is everything you need to handle accessory installation to tearing down a diesel. There's a "right" tool for every job! Put this set to work on the job and cut repair time to a minimum with tools that are "The Choice of Better Mechanics."

SNAP-ON-TOOLS CORPORATION
Oil Field Division
8098-F 28th Ave., Kenosha, Wis.

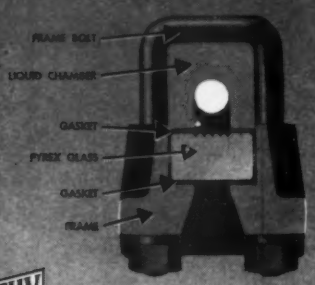
only PENBERTHY *Reflex*
LIQUID LEVEL GAGES
Have All These Features

Drop Forged Steel



1. **PROTECTED GLASS.** Frame completely contains glass—no part exposed. Glass supports none of frame weight.
2. **UNIFORM GASKET PRESSURE** assured by precision finishing of retaining surfaces.
3. **EQUAL RESILIENCE ON BOTH SIDES OF GLASS** due to interchangeable gaskets which also prevent improper reassembly in the field.
4. **PERFECT GASKET JOINTS WITH MINIMUM BOLT TENSION** because misalignment of parts is impossible. This also eliminates frequent cause of glass breakage.
5. **DISTORTION PREVENTED** by reinforcing beam and scientific distribution of metal in frame. (Distortion is a serious cause of glass breakage.)
6. **GASKET BLOW-OUTS PREVENTED** by full metal backing of surface and periphery of both gaskets.
7. **RIGIDITY AND PERFECT ALIGNMENT** assured because liquid chamber is machined from solid block of temperature resistant steel heat treated to prevent warping.
8. **PYREX GLASS** is used exclusively because it has proved far superior in resistance to thermal shock and erosion.

Penberthy Reflex Gages make reading of liquid level easy and unmistakable; empty space always shows white—liquid always shows black. They are made in any length desired and from various materials to successfully withstand corrosion, contamination and high temperature conditions. Conform with API—ASME standards.



PENBERTHY PRODUCTS

PENBERTHY INJECTOR COMPANY

Manufacturers of QUALITY PRODUCTS Since 1886

DETROIT 2, MICHIGAN • *Canadian Plant* • *Windsor, Ontario*

3731

cost of crude oil is much higher than it was in 1920. Wages and salaries are higher. Transportation costs are higher. Taxes — all of the federal, state and local taxes that help boost the price of every product—are higher. The purchasing power of the dollar is less.

"The petroleum industry, however, as the demand for the products of petroleum soared, has been able to find more and more sources of crude oil. It has been able to increase greatly the efficiency of manufacture, distribution and transportation. These have helped to combat the tendency of gasoline prices to soar."

The Flying Red Horse, published for Socony-Vacuum Oil Co., Ind., and affiliates.

"Inflated Profits"

". . . It's hard to . . . realize how ridiculously untrue are the malicious comments you sometimes hear about 'inflated profits' of big companies.

"Expenses (of Esso Standard Oil Co.) on the basis of a weekly income of $100 . . . amount to $88.93.

"What's left is $11.07, just over 10 per cent of the income. Of this, $4.08 represents cash dividends to the shareholders. This leaves $6.99 for expansion of company operations and to maintain a sound finnancial position. Actually, this was not adequate last year to take care of our tremendous expansion program.

"You, personally, save 10 per cent of your salary if you're in the Thrift Plan for the maximum amount. . . .

"Would you say *you're* enjoying 'inflated profits.'?

The Esso Refiner, Esso Standard Oil Co.

Don't Keep it Secret

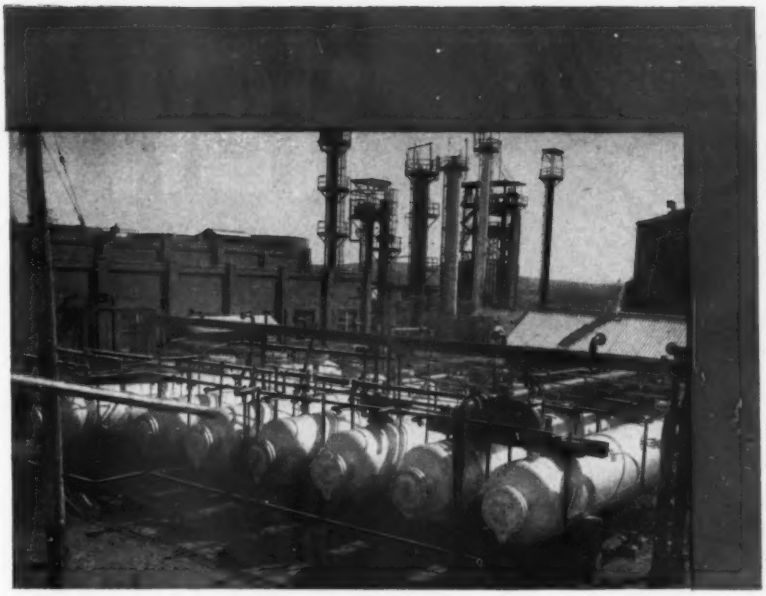
"What has become of the industry's gasoline-tax signs and notices?

"With all branches of government —cities, states, and especially Washington—yelling loudly for more and more revenue and things to tax, including gasoline, why does not the oil industry resurrect its old campaign to tell the public the gasoline tax it is paying?"

Kansas Oil Men's Association Bulletin.

Time to Tighten Up

"Let's not forget that it is highly important that we make a profit on what we sell. Our business is still confronted with abnormal demands for cash. Taxes are high and are going higher; the cost of construction is double that of a few years ago; so you see, if our company is to be able to continue to expand its producing, refining, pipe-line and marketing facilities . . . we must all make a contribution to this program by effecting the most efficient operations possible in our respective departments. Unnecessary expenses must be elimi-



FIRE PROTECTION *Tailored* **FOR INDUSTRY'S NEEDS**

Not unlike the clothing industry, effective fire protection must be tailored to fit the need . . . tailored to each individual requirement—occupancy—hazard and risk. Recent advancements now make it technically and economically possible to handle problems of extreme hazard to personnel and to production continuity. A typical problem was the storage of propane at the illustrated refining operation. With the problem studied, the hazard analyzed and the measurements exactingly approved, specialized *Automatic* FIRE-FOG was installed and is today, ready, willing and able to combat fire at the first indication of flame.

Many installations of this and similar nature have been made in chemical processing properties throughout the country and, like any worth-while product, *Automatic* FIRE-FOG stands on its records of achievement . . . records which are written into the reports of all leading fire insurance bureaus.

Whether your needs call for *Automatic Sprinklers* chemical or mechanical foam, CO_2 gas, *Automatic* FIRE-FOG or a combination system of protection, our preliminary engineering service now makes it possible to fairly evaluate the economic and adaptability features of each method for your own risk. Detailed information is available upon request. Write or call today.

"AUTOMATIC" SPRINKLER CORP. OF AMERICA
YOUNGSTOWN 1, OHIO

Automatic
FIRE-FOG
IT BLANKETS . IT ISOLATES . IT QUENCHES

. . . a famous member of the *Automatic Sprinkler* Family . . . provides basic fire protection for process equipment and storage in the chemical and petroleum industries. On-the-spot protection for quench tanks, dryers, explosive hazards, conveyor openings, air filters, oil filled electrical equipment and other units vital to production line operations.

Automatic Sprinkler
FIRST IN FIRE PROTECTION
DEVELOPMENT . ENGINEERING MANUFACTURE . INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

NEW!
individually
REGISTERED
and completely
GUARANTEED
ROXCO
ROXCO
TRIMONT MFG. CO. ROXBURY, MASS. U.S.A.
Special
MONEY-BACK
TRIAL OFFER!
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R. W. McDowell, president, Mid-Continent Petroleum Corp., writing in the Diamond.

Texas Tax Boost?

"It is the duty of you lawmakers next session to increase the revenue from the state gasoline tax. We have reached the saturation point where highway income is insufficient to meet the maintenance costs of highways we now have due to the steady deterioration of our far-flung system."

John C. Calhoun, chairman, state Democratic executive committee, speaking in Bangs, Tex.

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"From the industry's point of view it might be well for all planes to burn gasoline. At present a barrel of crude oil produces 45 per cent gasoline and only 8 per cent kerosine. The rest becomes heating oils and lubricants. However, we think it would be best for commercial (turbojet and turboprop) airliners to use kerosine."

A. R. Ogston, Esso Export Corp., addressing aviation writers in New York.

Oil's Economics

"Hurt the ability of the explorer to get his money back and you hurt his ability to spend it again looking for more oil. The relationship of reward and effort is crystal clear in oil. A simple chart of the price of oil and the total number of wells drilled year after year will make it plain—the higher the price of oil, the more wells drilled; the lower, the fewer."

Arthur W. Baum, associate editor, in the Saturday Evening Post.

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"The crucial factor determining the success or failure of small business will continue to be, as it has always been, the caliber of management. In a field where the number of would-be competitors vastly exceeds the practicable number of operating units, it is inevitable that only the relatively few who are fittest can survive. And in an age when mass production and advanced technology have shown the enormous social savings of which they are capable, the number of surviving units is necessarily more limited than in an age of handicrafts.

The Guaranty Survey, Guaranty Trust Co. of New York.

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Electric Resistance and Fusion Weld—Plain End	8⅝" to 22" O.D.	Up to 40'	.188" to .500"	Napa, Calif.—Basalt-Kaiser
Electric Resistance Weld—Plain End	5⅝" to 12¾" O.D.	Up to 55'	.188" to .400"	Fontana, Calif.
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JOURNALLY Speaking

Neither Rain nor Snow

IS your whole day upset because your copy of the Journal doesn't arrive on schedule? Quite a few of our readers are having this unfortunate experience.

Don't blame us. Blame Uncle Sam. It's all the fault of the postal service—if the word "service" is still appropriate in that connection. Ever since the war the mails have been going from bad to worse, and lately they have been getting no better fast. Even first-class mail isn't what it used to be, and it would appear that magazines and periodicals get delivered when the carriers have nothing else to do.

The motto of the Boys in Gray is something to the effect that "neither rain nor snow nor dark of night stays these swift couriers from the sure completion of their appointed rounds." But where nature failed to stay them, bureaucratic mismanagement has succeeded. At least that's the way we explain it. But whatever the explanation, there is plenty of proof that the mail service has deteriorated to a condition which may appropriately be characterized as lousy.

If you have any complaint about nondelivery of our favorite oil publication, please let us know. We will take it up with our Tulsa postmaster, who is doing the best he can under the regulations and restrictions from Washington. Or you might complain direct to your own postmaster, or try that good, old, standard remedy: Write your Congressman. If enough of the Post Office Department's "clients" raise a little Ned it might do some good.

We Started It

A YEAR ago the oil industry was in a dither over the figures on petroleum imports and exports. Some people quoted one set of statistics and others used different figures, and nobody seemed to be able to make them jibe.

So the Journal's economics editor, John Casper, set out to bring order out of the confusion. He found that the chief missing link in the statistics was military shipments of oil out of this country. During the war, of course, that had been a deep military secret, and the ban had never been lifted.

But our Washington editor, Bert Linz, using the Journal's prestige and his own persuasiveness, induced the Munitions Board to supply us with the information. With this dope in hand, John put together a simple and satisfying explanation of what the import-export figures meant and how to interpret them in the future, which was printed in our issue of last July 28.

Once the ban was relaxed, the American Petroleum Institute induced the military to release the figures on a current basis. And now the Bureau of Mines has begun to include them in its regular reports. So the industry at last has complete and understandable figures on petroleum imports and exports, thanks to our initial efforts.

You're welcome. Just a sample of the usual Journal service.

Good Locale

A SUBSCRIBER in Reno, Nev., writes: "This biggest little city in the world (Chamber of Gamblers) is lousy with grease hounds, rock hounds, lease jockeys, and royalty buyers."

He didn't explain whether they are in Reno for the same reasons that most other people go there or whether their presence is due to the fact that a couple of major oil companies are doing some exploratory work in the state. But if there is any sort of an oil fever in Nevada, Reno ought to be a swell place for trading in acreage and royalties, what with half the population engaged in gambling anyway and the other half there to get unhitched from one bad gamble in order to try another one.

—Henry D. Ralph.

XUM

DOWELL SPINNER SURVEY pin-pointed tight zone— Selective Acidizing did the rest

A newly deepened well was producing 8 bbls. of oil per day on pump. Dowell engineers ran a Spinner Survey and, on the basis of the permeability profile obtained, used the Electric Pilot to acidize *selectively* only the newly deepened section. The treatment increased production to 65 bbls. of oil per day, flowing.

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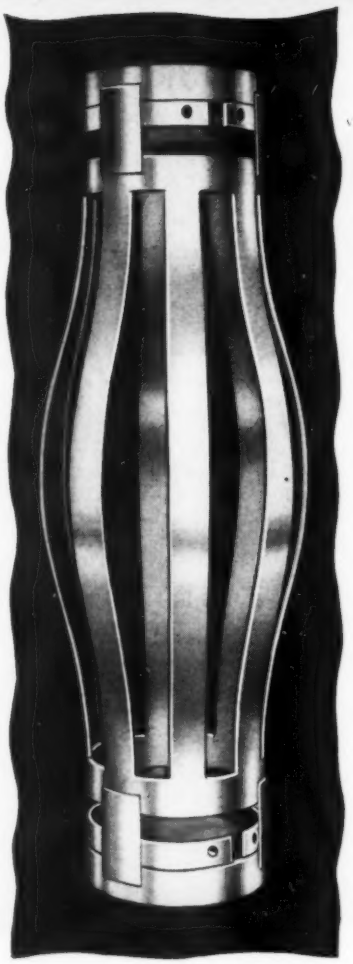
"TORTURE TESTING" definitely proves Baker Model "G"



Casing Centralizers provide MAXIMUM CENTERING FORCE

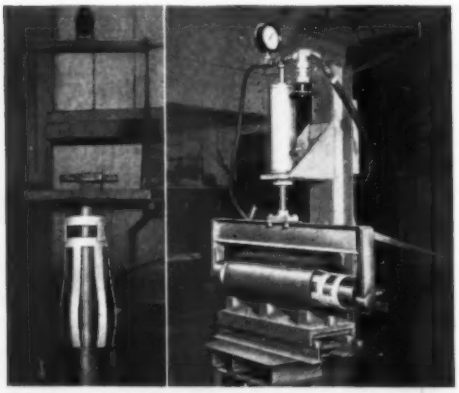
Only when "maximum centering force" is applied to casing at the cementing point, can you obtain a sufficient annular space to permit uniform distribution of the cement slurry completely around the casing. The hazard of channeling is minimized, and chances for successful "first time" cementing are increased.

The test of any casing centralizer is its ability to exert MAXIMUM CENTERING FORCE *after* repeated flattening of its springs during the trip down-hole. That's why the Baker testing laboratory has been kept in constant use during the designing, development and actual proving of the Baker Model "G" Casing Centralizer. Comprehensive tests, simulating every conceivable hole condition to which a centralizer is subjected, were performed in arriving at its efficient design.

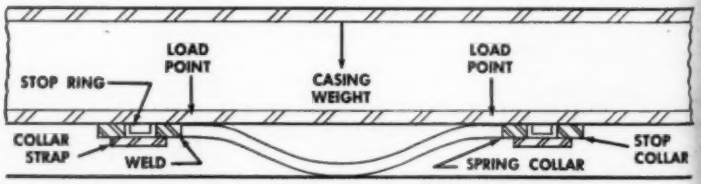
During the course of these tests, every type of spring-equipped centralizer was studied. The exclusive design of the Baker Centralizer proved conclusively to be the optimum.

And here are the outstanding features of the Baker Model "G" Casing Centralizer confirmed by "torture testing" . . . 1. Its MAXIMUM CENTERING FORCE is exerted when it reaches the cementing point, regardless of how many times the springs have been flattened due to "dog legs" or tight spots in the hole. 2. Th springs are securely butt-welded to t spring collars in a design that impos the load point *upon the casing.* 3. *springs compress simultaneously,* a cannot be compressed individually. The *casing can be rotated* while the centralizer remains stationary. 5. It starts easily, without "snubbing." 6. All parts of the assembly are pre-positioned, ready for immediate, easy installation on the casing.

Ask any Baker representative or office for *your* copy of the new 16-page brochure which contains complete details and illustrations of the Baker Model "G" Casing Centralizer.



LEFT: Testing to determine the maximum number of springs of optimum bowed height to permit easy starting without "snubbing." RIGHT: With this testing device it is possible not only to simulate rugged down-hole travel by repeatedly flattening the springs, but also to find the effective centering force of the centralizer in the open hole after such treatment. The MAXIMUM CENTERING FORCE can easily be determined from a performance curve showing the centering force at various intervals of deflection.



Here is the ideal in spring design and mounting, found only in the Baker Model "G" Casing Centralizer. Note how the load point is imposed directly upon the casing; and how the properly "contoured" spring is free to move along the smooth surface of the casing as it deflects under compression. There is no chance for concentration of stress to cause a permanent set, or breaking of the spring. Note that ample clearance exists between Stop Rings and Centralizer Collars to accommodate the increased length of the springs that results from their complete flattening.

***Remember!* You get MAXIMUM CENTERING FORCE only with BAKER Model "G" CASING CENTRALIZERS**

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XUM

Fight Just Started

The oil states must not throw in the sponge as a result of the Supreme Court decisions of last week in the Texas and Louisiana tideland cases.

They should continue the fight with the support not only of the oil operators directly concerned but the entire petroleum industry. Furthermore the oil business and the tideland states, wholly aside from the protection of their own interests, have the duty of alerting the entire nation to the issues of public policy involved.

In the latest decisions a majority of the highest court saw fit to ignore the exhaustive and comprehensive defense presented by the two states concerned with broad and specific legal matters applying to Texas and Louisiana, and accepted the findings of the California case of 3 years ago as establishing the judicial precedent.

"What is to be done now?" is the current question, with a somewhat hopeless attitude on the part of some. Actually the decisions did not change the basic issues and the needed solutions first posed by the California court.

The Supreme Court findings give the federal Government "paramount rights" to marginal sea areas. The court did not hold that the tidelands belong to the Government outright nor did it hold that legislation could not reestablish state ownership which was never challenged successfully from the birth of this country until the California decision.

This means that final powers rest with Congress. There is reason to believe that if the legislators were made to understand fully the immediate and long-range significance of the court's decisions the tidelands would be quickly returned to the states with an overriding of a presidential veto if necessary.

The California decision was based on national security. For the lay mind at least it is difficult to see how security is jeopardized by the private search for and development of petroleum along the marginal sea. The record is clear that national security oilwise is best served through private ownership and state regulation and not through federal controls.

The question naturally arises as to the limits of national security as an excuse for the extension of federal authority. Justice Reed in his dissent in the Texas case sensed that situation when he said:

"The needs of defense and foreign affairs alone cannot transfer ownership of an ocean bed from a state to the federal Government any more than they could transfer iron ore under uplands from state to federal ownership. . . . National responsibility is no greater to the marginal sea than it is toward every other particle of American territory."

There is no question as to what the attitude of the American public and its representatives in Congress will be once they understand that the decisions are a further step toward socializing of business and present issues which go to the roots of our form of government and our way of life.

XUM

THIS WEEK

IMPORTS—State Department tells Congress oil imports hurt U. S. economy much less than would restrictions. . . . Sees disruption of foreign trade, relations with producing countries. . . . ¶Socony-Vacuum says coal's troubles not attributable to oil imports. . . . ¶Eastern marketers say importing companies, not independent producers, suffer biggest share of domestic curtailment. . . . ¶House committee rejects increase in oil-imports tax in revenue bill. . . .

TIDELANDS—Interior Department making plans to take over administration of Gulf Coast offshore oil. . . . ¶Bill to continue states' rights to tidelands pushed hard in Congress but little chance seen for enactment this year. . . . O'Mahoney proposes "interim" legislation. . . . ¶Texas and Louisiana officials will continue fight for control in courts and Congress. . . .

OUTLOOK—Strong market for petroleum products reflected in Bureau of Mines forecast that domestic demand this year will be 7.1 per cent over last. . . . But big drop in exports will hold total demand to an increase of 5.7 per cent. . . . And 2-year comparison indicates the rate of market expansion is about 3.6 per cent annually. . . .

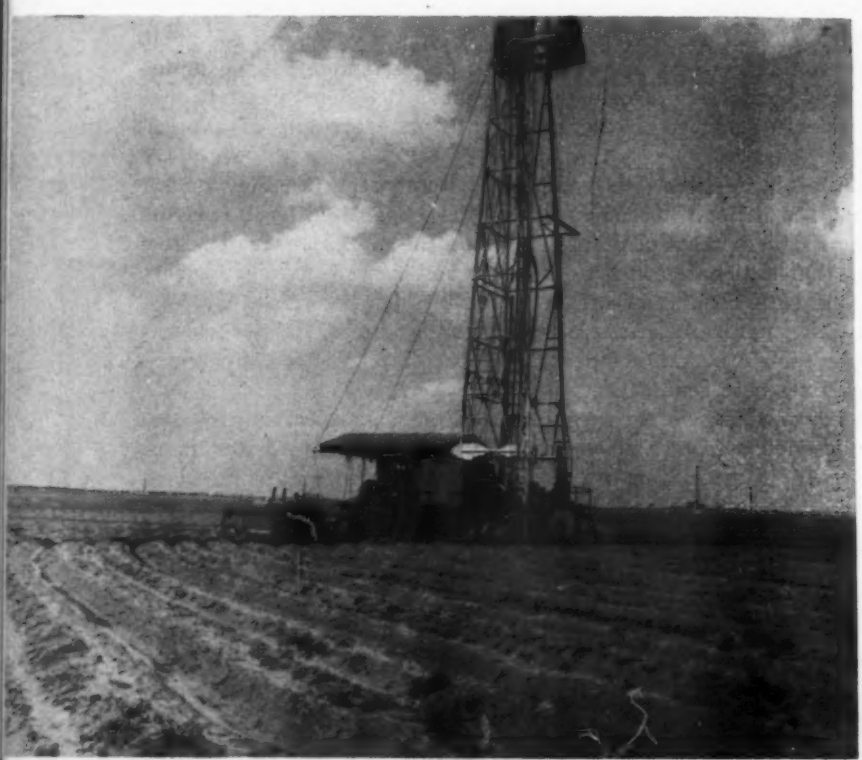
ACTIVITY—Crude production averaged 5,246,250 bbl. daily for week ended June 10, an increase of 94,425 bbl. daily over previous week and 366,075 bbl. daily over same week last year. . . . ¶Total completions were up 7 wells for the week to 833 compared with 786 last year. . . . Wildcat completions, at 162 wells, were up 31 from same week in 1949. . . . ¶A total of 2,178 rotary rigs were operating in United States on June 5, a gain of 122 rigs in past 3 weeks. . . .

TRENDS—Increases in distillate stocks have not yet reached 2,000,000 bbl. per week. . . . Weekly increases, averaging 2,000,000 bbl. from now until end of September, would raise distillate stocks to only 77,000,000 bbl. compared with 83,000,000 bbl. last year. . . . ¶Additions to kerosine storage averaged 1,000,000 bbl. per week for past 4 weeks. . . . At this rate, last year's peak would be reached before the end of August. . . .

CONGRESS—Senate prepares for its virtually annual investigation of gasoline prices. . . . Retail price rise in Michigan sets off diatribe against the oil industry. . . . ¶Continuation of old synthetic-rubber program probable as Congress rejects administration's plan. . . . Producers warn that rising price of natural, disturbed world conditions, require freeing synthetics for development by private industry. . . .

INTERNATIONAL—Britain apparently avoiding settlement of basic issues in sterling-dollar oil dispute. . . . Meanwhile individual U. S. companies make working agreements to continue operating in sterling area. . . . ¶Dutch-Shell Group now has 10 per cent of world's oil production, regaining its prewar share. . . . ¶Venezuela and Saudi Arabia set new all-time high in crude production. . . . ¶Mexican oil activity running well ahead of 1949. . . .

REFINING—Houdriflow cracking unit at Tide Water Drumright plant provides flexible operation on Mid-Continent or sour crudes. . . . ¶Dow Chemical Co. will spend $30,000,000 on petroleum chemicals plant at Freeport, Tex. . . . ¶Construction is 3 months ahead of schedule on $4,000,000 expansion and modernization program at Standard Oil Co. (Ohio) refinery at Cleveland. . . . ¶Bell Oil & Gas Co. constructing U.O.P. Platforming unit at Grandfield, Okla. . . .



SKIDDING IN SCURRY.—Skidding rigs to new locations is not a new practice but is just being introduced into Scurry County to keep up with the drilling tempo there. Here McCain & Buels Rig Co., Midland, is crossing a terraced field with a 10,000-ft. rig of Whiman Drilling Co., Snyder, to a new location on a Pan-American lease in Kelley area of the 50-mile-long field.

Defense of Imports

State Department says domestic coal and oil troubles not due to imports, and restrictions would hurt foreign trade

Bertram F. Linz

WASHINGTON.—The State Department still sees nothing in the oil-import situation to cause it to view any restrictions as other than "unnecessary and inadvisable."

The first rebuttal of charges by domestic coal and oil interests that unbridled imports have created extensive unemployment and threaten the ability of the domestic industries to meet the exigencies of another war was made last week by Assistant Secretary of State Willard L. Thorp before the Senate labor subcommittee which is investigating the situation.

Thorp told Senators Neely, Thomas of Utah, and Taft, who comprise the subcommittee, that the oil industry today is in a highly favorable position with indications that operations this year will be better than in 1949. He admitted that unemployment in the domestic industry may have increased by as much as 16,000 as a result of last year's conditions, but suggested that some of this might be due to developments in drilling techniques.

Although Texas' production last year was 17 per cent under 1948 levels, Thorp said, some states set new production records and for all other states combined production was only 1 per cent below the peak level. These facts, he said, give evidence "that oil imports were not, and are not, solely responsible for the severity of the curtailment in Texas."

Sees no evil.—Recently, he told the subcommittee, there have been substantial increases in allowables, and output is expected to continue to increase with the major gains taking place in Texas.

"It does not seem possible to draw from the foregoing record of almost unparalleled well-being for the petroleum industry as a whole a conclusion that the industry has been seriously injured by imports to date or is likely to be so injured by those in prospect for the rest of the year," Thorp declared.

Thorp conceded that the coal industry has a serious problem, but pointed out that coal has been losing ground to oil and natural gas for over 30 years and said that what has been happening to coal in the recent past "appears far more to be a continuation of the long-term change which has been taking place in the relative positions of the two domestic industries rather than to be attributable to any new factor such as an increase in oil imports."

Imports of residual fuel oil, which fell off 20,000,000 bbl. in 1947, have increased only from 70,000,000 to 77,000,000 bbl. since 1946, Thorp said, while in the same period the total domestic consumption of residual declined from 519,000,000 to 495,000,000 bbl. Under the circumstances, he contended, it is difficult to see how imported oil could be held mainly responsible for a decline of 165,000,000 tons in coal production from 1948 to 1949.

Peril point. — Under intensive questioning by the senators, Thorp admitted that there must be a peril point in imports, but refused to attempt to guess where that point was. He denied that the State Department has ever entered into any commitments with the companies regarding the volume of imports to be permitted, and said that anyone believing himself injured by imports could apply to the Tariff Commission for an investigation under the escape clause of the reciprocal trade agreements or go to the Treasury for an investigation to determine whether oil was being dumped.

Neely dug up State Department records running back to the early war period with a view to showing that many of the officials involved in oil matters had been connected with or subsequently joined companies engaged in foreign operations. Thorp, who entered the department in 1945, was unable to identify most of the men named by the senator.

Thorp told the subcommittee the department always considers the effect of its policies upon employment in the United States and readily agreed that no single factor in international trade was as important as maintaining a strong and healthy domestic industry. But, he contended, there are many things to be taken into consideration in dealing with import problems.

Adverse effects.—"If imports of oil were reduced substantially, whether by imposing a quota, a high import tax, or by balancing imports and exports, the effects would be the same," he explained. "The action would seriously and adversely affect certain American interests, commercial, strategic, and political. In the absence of serious injury to the domestic oil and coal industry the disadvantages seem to outweigh the benefits in terms of the over-all national interest."

The assistant secretary cited three major instances in which commercial disadvantages would arise, the first being in the case of Venezuela, which is a $500,000,000 market the loss or curtailment of which would serve to reduce employment in this country.

The second, he said, is the domestic consumer interest, and restriction of fuel-oil imports would mean higher prices for fuel oil and increased costs both for industries that cannot convert to other fuels and those which can convert but only at great expense.

The third disadvantage would apply to American foreign-oil interests, where import limitations would adversely affect their American employes and suppliers of American equipment for their foreign operations, and weaken the American position in oil operations abroad, in

No Tax Raise

Tax drafters reject higher imports levy

WASHINGTON. — The House ways and means committee refused last week to increase the import taxes on imported oil.

The committee, in the last stages of perfecting the 1950 tax-reduction bill, rejected a proposal to increase the tax from 21 to 84 cents a barrel on crude. Tied in with it and also rejected was a proposal to levy a tax of $1.05 per barrel on residual fuel oil and to increase tax on gasoline and other motor fuel from 2½ to 3 cents per gallon.

The committee confirmed its previous tentative agreement not to reduce the existing percentage depletion allowance for oil and gas, but adopted a clarifying amendment to make certain that the basis upon which depletion allowances are computed is the gross income before transportation.

The new bill also will provide that upon liquidation of a foreign corporation, over 50 per cent of the stock of which is owned by domestic corporations, the domestic corporations will be taxed at ordinary rates on their ratable share of the accumulated earnings of the foreign corporation to the extent of the gain by the domestic corporations on the liquidation.

control of foreign reserves and facilities.

"Not only do we have a strategic interest in the political stability of the Middle East," Thorp said. "Political stability in that area, as in many countries, is to a large extent dependent on economic well-being. In certain Middle East areas, economic well-being depends mainly on the level of oil operations in which American companies have an extensive interest."

Mexican agreement. — An important consideration also is that we cannot, in circumstances where there is no serious injury traceable to oil imports, restrict them as some have proposed without violating our international commitments, Thorp continued. He told Neely that Mexico is considered to have violated her reciprocal trade agreement and action is being taken, but asked to be excused from discussing the matter in public. It is definitely known, however, that the department plans to abrogate the agreement and is seeking a way to do it in agreement with Mexico, rather than by denunciation, to avoid an unpleasant reaction in Mexico.

"The question of whether restrictions should be placed on oil imports is not a simple one of protecting certain private American interests from foreign interests or from other private American interests," Thorp concluded. "It is a matter involving broad questions of national policy and the decision should be the one which will best serve the national interest. The facts seem to indicate that the domestic oil and coal industries have not been seriously injured by oil imports to date, and that they are not threatened with serious injury by those in prospect in the near future. In the circumstances the proposed restrictions appear unnecessary and inadvisable."

Socony's view.—Charles L. Harding, director of Socony-Vacuum Oil Co., Inc., also told the subcommittee that coal producers would benefit but little from any curb on imports, while the unemployment resulting from the consequent disruption of our foreign trade, particularly with Venezuela, might exceed that of which Neely is complaining.

Harding was the first company official to appear before Neely, who said he would welcome the heads of the other importing companies if they wished to appear and would schedule hearings to suit their convenience "even at midnight."

What disadvantages are being experienced by the domestic oil industry, Harding said, are the result of crude imports which keep in the ground American oil that otherwise would have to be produced, but the industry as a whole, he declared, is in a high state of health.

Socony-Vacuum imports residual only for bunkering, bringing in currently about 3,000 bbl. daily as against 2,000 bbl. last year and anticipating a 1950 level of 3,500 bbl. a day, and so, Harding pointed out, is not trying to justify a trade in which it is engaged.

But, he said, the difficulties of the coal industry are not attributable to any great extent to the imports of residual, which will run around 240,000 bbl. daily, and the increase of 95,000 bbl. daily anticipated this year over 1948 is equivalent to less than 9,000,000 tons of coal a year, in contrast with the claim that because of oil imports coal production has lost 25,000,000 to 50,000,000 tons a year.

Imports Hurt Importers

Marketers say independent producers not injured because importing companies took biggest share of domestic cuts

NEW YORK.—The domestic producing operations of the 10 major companies importing oil into the United States took approximately 62 per cent of the total decline in crude production in this country last year, the Atlantic Coast Oil Conference, Inc., said last week.

The conference, an organization of East Coast marketing associations, is opposing the current campaign for a higher tariff or quota to curtail oil imports into the United States.

In a public statement, the conference presented figures to show that the drop in domestic production from 1948 to 1949 was caused not so much by additional imports as by the build-up of storage in 1948, a decline in export demand, and higher production of natural-gas liquids.

"There were 10 principal crude-oil importing companies that brought in most of the foreign crude last year," the conference said. "Those companies have now published their annual reports, and from them can be taken the amount of crude oil which those companies produced in the United States.

"Of the decrease of 478,000 bbl. daily in total production of the country last year, those 10 companies took a reduction in their own domestic production of 297,000 bbl. daily. That leaves a reduction of only 181,000 bbl. daily for the balance of the domestic industry. Approximately 62 per cent of the decrease in domestic crude-oil outlet was carried by the importing companies last year, and only 38 per cent by the balance of the industry. The gross production of those 10 companies declined approximately 14 per cent last year, whereas the rest of the industry suffered a decline of about 6 per cent.

"Two conclusions are suggested," the conference continued. "One, that the domestic industry may not really have been hurt, and two, that the decline in domestic outlet, which is the measure of that hurt, was not caused so much by increased imports as by other factors."

The conference included the accompanying table to back up its contention that imports were not the major factor in the domestic production decline.

DEMAND AND IMPORTS FOR 1948 AND 1949
(Thousands of barrels per day)

	1948	1949	Volume change*	Per cent of 478,000 bbl./day
Total demand (incl. exports)	6,143	6,120	— 23	4.8
Natural-gas liquids produced	402	428	+ 26	5.4
Total imports	514	642	+128	26.8
Stock change	+293	—8	—301	63.0
Domestic crude-oil production	5,520	5,042	—478	100.0

*All of these represent decreased outlet for domestic crude, irrespective of plus or minus signs.

Perennial Probe

Gasoline prices again up for Senate investigation

WASHINGTON.—The 1950 version of the gasoline-price investigation which Congress makes almost annually was launched in the Senate last week by Senators Homer Ferguson of Michigan and Joseph C. O'Mahoney of Wyoming, sparked by the latest of 10 increases which they said have been made in the past 4 years.

The Senate judiciary committee approved the investigation by unanimous vote June 10, and asked the rules committee to permit the Senate to vote on it. It is estimated the inquiry will cost $50,000, and it was decided it should be conducted by the full committee.

Introduction of a resolution calling for an inquiry by the Senate judiciary committee came following agitation in Michigan where it was charged that although the state has not increased its gasoline tax it has had price increases as great as or greater

than states which have hiked their rate.

Last year's price investigation was conducted by the Senate banking and currency committee, which found nothing necessitating congressional action. Committee Chairman Burnet R. Maybank of South Carolina said he had no intention of renewing his study this year, attributing the latest increase to market conditions.

Explaining the resolution to the Senate, however, Ferguson asserted that previous studies of gasoline prices have been devoted almost exclusively to the economic factors which may be involved, but those factors, he said, "seem to operate in just one way—to rationalize price increases, and never to suggest the possibility or necessity of decreases."

"I believe that we should look behind the economic elements, and investigate the competitive situation as it exists in the gasoline industry, to determine whether it has a bearing on the price pattern," Ferguson added.

"The normal operation of the price system is that when one producer reduces prices his competitors seek to match the cut. It does not follow that when one producer raises prices his competitors should do likewise. The normal operation of the market should be to the contrary. Yet we see just that happening, time after time. It smells of monopolistic practices and manipulations."

The purpose of the investigation, Ferguson's resolution set forth, would be to determine whether any legislation is necessary to supplement the antitrust laws to remedy any unwholesome practices which may exist within any part of the petroleum industry. The committee would be required to make its report to the Senate by December 31, next.

The Tidelands Plum

Bureaucrats smack their lips and prepare to grab it, but courts and Congress may delay their offshore oil prize

Bertram F. Linz

WASHINGTON.—Apparently acting on the assumption that the last word has been said with respect to ownership of oil deposits off the coasts of California, Texas, and Louisiana, the Interior Department last week reportedly was preparing to take over control and administration of the tidelands which have been awarded the federal Government in three Supreme Court decisions.

At the same time, the department laid down plans for a 20-year program for mapping the oil and other deposits in the tidelands, to cost an estimated $50,000,000. The first 5 years of the project will be devoted to a survey of the Gulf deposits which the Geological Survey estimates at 13,000,000,000 bbl., Thomas B. Nolan, assistant director, told a House committee.

Nolan read a statement prepared by William E. Wrather, director of the survey, that "the seaward extension of the rich oil fields of the Gulf Coast states has been demonstrated by recent discoveries offshore." The tidelands deposits, Wrather said, constitute the highest potential reserves inside or adjacent to the continental United States.

Power assumed.—In assuming actual control of the Texas-Louisiana deposits, the department will act under powers granted in September 1945, in the President's proclamation asserting American ownership of the Continental Shelf. Officials contend that the proclamation is sufficient authority for the taking of "reasonable" measures to protect the Government from loss.

So far as the tidelands are concerned, as differentiated from the Continental Shelf, department attorneys argue that the court's decision vested title in the federal Government and there is no necessity to await a formal decree, which cannot be rendered until further proceedings have been completed.

Whether the department will make an effort to administer the tidelands oil fields, including the making of leases, without authority from Congress may be made clear in a statement which Secretary Oscar L. Chapman is expected to issue within a few days. The department made no effort to take over the California tidelands awarded the Government 3 years ago because of a ruling that the Mineral Leasing Act would not apply to the underwater deposits, and has patiently been waiting for Congress to enact the administration bill setting forth the leasing and other conditions to be followed.

Congress split.—The fight over legislation restoring title in the tidelands to the states has so split Congress that it is generally believed neither the quitclaim nor the administration bill could be passed, and there is no indication that the stalemate can be overcome this year. If Congress passes either measure this session, it will act first on the quitclaim bill, which the President is expected to veto, and resentment over his action, in that event, would preclude enactment of legislation for federal management.

Under this month's decisions of the court, the Department of Justice and the states are given until September 15 in which to prepare a suggested form of decree. Texas certainly, and Louisiana probably, will ask for a rehearing of the cases, and proceedings may string along indefinitely.

There were indications that the situation may lead to a revival of efforts to work out compromise legislation, such as was unsuccessfully attempted last year by House Speaker Sam Rayburn of Texas, under which the federal Government would delegate to the states the actual management of the underwater oil fields and divide the revenue therefrom with them.

Scheming.—Members of Congress appeared apprehensive over the possible action of the department to take over control of the Continental Shelf area, at least, in which the bulk of the offshore oil is believed to lie, and were talking of a quick agreement to prevent the department from attaining a strong position from which it might be difficult to dislodge it later.

The two big questions which an effort to compromise the issue raised were whether it now would be possible, in view of the log-jam of bills in the Senate, to get legislation through Congress before adjournment, and whether the Government, fortified by its unbroken string of successes in the court, would be willing to give up any measure of control.

There probably would be no difficulty in arriving at a division of the proceeds between the federal Government and the states, for the administration management bill makes provision for such a cut, the actual proportions of which would be determined and written in when the measure was considered.

O'Mahoney's plan.—Declaring that the court decision left existing oil leases in a "vacuum," Sen. Joseph C. O'Mahoney of Wyoming, chairman of the Senate interior committee, said June 12 he will introduce a resolution to keep them in a "status quo basis" following consultations with Interior and Justice department officials.

His proposed legislation will permit the federal Government to supervise operations in the Texas and Louisiana submerged oil areas until permanent legislation can be enacted.

O'Mahoney said it is essential that immediate action be taken to protect the Government from loss, and said, too, the Government should recognize the "good faith" in which leases were entered into by the states and the oil companies. There is adequate precedent, he said, for the recognition of the equities established in good faith by the companies with the states.

Under the resolution, royalties and other revenues derived from offshore oil operations would be frozen and placed in a special fund to be held

until the question of administration is settled, as has been done in the case of California.

O'Mahoney said the provisions of the mineral leasing act cannot be applied to the tidelands because offshore development was not contemplated when the law was passed in 1920, and it would not be adequate to deal with the submerged-oil situation.

O'Mahoney expressed doubt that time would permit the enactment of quitclaim legislation before Congress adjourns, and added that in the doubtful case of Congress passing such legislation the President would veto it. His count of votes, he said, indicated that a veto could not be overriden.

Legislation giving the Interior Department administration over the tidelands was written by O'Mahoney following the Supreme Court decision in the California case. It has never been considered by either Senate or House and there is no indication that any effort will be made to press it this year.

Still Fighting

Texas and Louisiana won't take court decision as final, redouble efforts to have Congress confirm offshore claim

Leigh S. McCaslin, Jr.

HOUSTON.—Strong criticism of the Supreme Court and a call for immediate action by Congress highlight Gulf Coast reactions to the federal Government's victory in the tidelands cases.

Reactions during the week following the decision included:

1. Hines H. Baker, president of Humble Oil & Refining Co. and chairman of the American Petroleum Institute's tidelands study committee, made a detailed public statement highlighted by a request for quick congressional action.

2. R. L. Foree, president of the Texas Independent Producers and Royalty Owners Association, said: "As loyal Texans we are shocked by the Supreme Court decision to license federal confiscation of our state tidelands. On these same grounds of possible importance to our national defense no state or private property is safe and no agreement with our federal Government valid."

3. The Louisiana House of Representatives unanimously asked Congress to restore the state title to the tidelands.

4. Texas Railroad Commissioner Ernest O. Thompson suggested that Texas exercise its historic right and divide into five states. This would give the state 10 senators, Thompson said, and increase its chances of favorable legislation.

5. The Louisiana attorney general's office petitioned the state legislature for money to continue fighting the tidelands case.

6. Texas ordered that money obtained from oil and gas production in the tidelands be placed "in suspense." According to Land Commissioner Bascom Giles, the state has received $8,571,872, to date, from submerged lands affected by the decision.

7. Ohio Oil Co. and Melben Oil Co. filed a suit against Texas asking for the return of $123,360 paid under protest last November 7 as yearly rental on tidelands leases.

8. H. J. Porter, Houston independent, called the decision "an invasion of states' rights." Porter, a lifelong Democrat, ran on the Republican ticket for U. S. senator in 1948.

9. Harold E. Decker, president of Houston Oil Co. of Texas and a director of the Independent Petroleum Association of America, said it was "an extremely unfair decision."

Baker's view.—In his statement, Hines Baker said the Supreme Court's holdings in the Texas and Louisiana tidelands cases are "very disappointing and disturbing."

"They brush aside state titles to the tidelands, which until recently have been universally recognized since the founding of this Republic," the Humble president said. "The ruling in the Texas case disregards the solemn agreement between Texas and the United States reserving the tidelands to Texas when it became a state. It is a serious blow to the Texas permanent school fund."

Baker said that the doctrine announced in the two cases is dangerous and "if pursued to its logical conclusion, it might lead to nationalization without compensation of all resources useful in defending the country."

He continued by saying that Texas and Louisiana operators "have spent in excess of $200,000,000 in bonuses and rentals, in exploring for oil and gas on these areas, in drilling dry holes, and in drilling and operating producing wells, and have recovered less than $2,000,000 in oil production."

"Their rights are jeopardized and should be preserved and protected. Only private industry can find, develop, and produce the oil essential to our peacetime economy and national defense. The safety and welfare of our country are thus involved."

Baker said that the matter is now up to Congress, and "we cannot and do not assume that Congress, which has constitutional control over government property, will execute its power in such a way as to bring about injustices to states, their subdivisions, or persons acting pursuant to their permission."

The Humble president referred to the Walter bill, which is now pending in the House of Representatives, and which would quitclaim to the states areas within their traditional boundaries, provide a leasing policy for areas outside state boundaries, and confirm existing leases acquired from the states.

He added that the bill "is a measure which resolves the conflicting interests of all concerned satisfactorily. It is supported in principle by the Governor's Conference, the American Bar Association, and other civic and patriotic organizations, and has the active and vigorous support of the National Association of Attorneys General. Early action by Congress is highly important."

Rubber Rebound

Synthetics producers ask Congress to free industry for expansion to meet threat of dependence on natural rubber

WASHINGTON.—The United States today is facing an interruption of natural rubber supply as serious as that which attended the Japanese conquest in the Far East in 1942, it was developed last week during hearings on the Government's synthetic-rubber program.

The situation in the Far East was outlined at the opening of the hearing by Sen. Lyndon B. Johnson of Texas, chairman of the Senate armed services subcommittee, who said the natural rubber area was in "great and visible peril" not equaled since Pearl Harbor and might well be the first great casualty of the cold war.

The situation was later spelled out by John L. Collyer, president of the B. F. Goodrich Co., who warned against the complacency with which this country viewed the possibilities of the first 2 years of the last war, when only Europe was involved in hostilities.

"Today," Collyer said, "the rubber-producing areas are not tranquil—they are battlefields in the global war between freedom and Communism. The threat of economic disruption—if not conquest—of these Far Eastern lands by Communism is far more serious than the apparent Japanese threat as most Americans viewed it in 1940.

Recent events suggest more than a possibility of a decline in Far Eastern rubber output due to internal difficulties or another shutoff, for a period anyway, of supplies from the Far East should the rubber-producing areas be overrun—this time by Communist conquest."

Price climbing.—Recent reports to Washington have shown steady increases in raw-rubber prices, the result of a world demand far outrunning world supply due to record demand for tires, stockpiling by the Government, and unprecedentedly heavy Russian buying which indicates that the Soviets also are stockpiling rubber.

In view of these factors, the House last month turned down the administration's proposals for disposition of the war-built synthetic-rubber plants and voted continuation of the present law for another 3 years.

The administration refused to give up the fight, and Asst. Secretary of Commerce Thomas C. Blaisdell, Jr., appeared before the Senate subcommittee last week to voice the "considered judgment" that the security interests of the country will best be served by the transfer of the synthetic facilities to private industry at this time.

Research needed.—Most of the rubber-industry spokesmen approved of the basic idea of putting synthetic production in private hands, but with certain modifications of the President's program. The present government monopoly, they charged, is stifling research and investment in synthetic rubber by private industry and continuance will inevitably weaken rather than strengthen our national security.

The only dissent from this view came from P. W. Litchfield, chairman of the board of the Goodyear Tire & Rubber Co., who recommended a 2-year continuance of the present law during which synthetic output would be increased and a national inventory of 200,000 long tons of finished GR-S would be built up.

A splitting of the program to turn the butyl plants over to private industry regardless of the disposition of the other facilities was recommended by O. V. Tracy, manager of the chemical-products department of Esso Standard Oil Co. Tracy pointed out that present indications are that the demand for butyl is assured, provided only that development is not impeded and wider markets can be sought. Esso has spent $11,000,000 in development work, he said, but will not be able to justify continuance if there is no prospect of any return.

Impressed by the arguments against the administration program, the committee, late last week, approved a 2-year continuance of the present law and sent the measure to the Senate floor for consideration.

WATCHING WASHINGTON

Bertram F. Linz

Tidelands Troubles

The Supreme Court appears to have given the federal Government valid claim to anything valuable lying under as little as 3 to 10 ft. of water off any of the 21 states along our coasts—barring an act of Congress to the contrary.

In most quarters it is agreed that if the Government wants to file suits to secure "paramount rights" to any valuable deposits underlying the coasts of other states, the granting of its petitions by the court is assured.

Meanwhile, the Government has added tremendously to offshore oil holdings which it can neither lease nor develop itself until given authority by Congress. There is no chance whatever that Congress will attempt to enact a law for federal administration this session, and just about as little that it will act to restore tidelands to the states despite the fact that such a bill has been favorably reported by the House judiciary committee.

Although the Government has won every round so far, the fight is far from over. The court handed down its decision in the California case in June 1947, and 3 years later the line has not yet been drawn between the Government's area and California's inshore waters. On that basis it may be a long time before the Government knows the boundaries of what it has won off Texas and Louisiana, particularly if the Texas appeal for a rehearing is granted, and still longer, maybe, before Congress decides between restoration of title to the states and federal administration.

The tidelands bill will come up for action by the House in the near future and passage is viewed as a certainty in most quarters. There is considerable doubt, however, that the Senate would do anything with the measure this year, and there is a growing impression that the issue may drag along indefinitely, possibly until 1953 when the tenancy of the by-then-restored White House may change hands.

Fuel of the Future?

Major changes appear to be brewing in the motor-fuel field, so far quietly—if that word can be applied to anything as explosive as gasoline.

Experiments in the use of butane and propane as motor fuels were given a big boost this month when delegates to an American Transit Association regional conference in Washington were told that some 15 bus companies in various parts of the country already have converted their fleets to propane and many others are contemplating doing so.

The ATA was told there are specific advantages in the use of propane and in the long run conversion costs can be offset. Three major advantages were cited: A saving of up to 2 cents a mile in fuel costs; increased safety because L.P.G. tanks have 20 times greater resistance to impact rupture than gasoline tanks; and less odor since it burns clean and there is no fuel unburned or wasted.

Strategy on Imports

The issue of oil imports will come to a head within the next few weeks, when the administration may be forced to take a definite position on the question of foreign versus domestic industry.

Both Sen. Matthew M. Neely of West Virginia and Rep. Tom Steed of Oklahoma, chairmen of subcommittees studying the effect of imports on domestic employment, have said that upon conclusion of their inquiries they will turn all the testimony over to President Truman with a request that he take whatever steps are advisable under the Reciprocal Trade Act and the antitdumping law to curb oil imports.

Meanwhile, however, efforts will continue to be made in Congress to secure the adoption of a rider to other legislation either increasing the import tax or imposing a quota on foreign oil. The first effort in that direction failed last week, when the House ways and means committee refused to include an increased import levy in the tax bill it is now readying for the House. Another effort may be made when the measure reaches the floor and, in the event of failure, still another if and when it gets before the Senate.

President Truman may refuse to take any action and the effort to secure legislation may fail, but the men spearheading the drive contend that the strong fight that is being put up may at least influence the thinking of the importing companies. And, they say, they don't care whether a reduction of imports comes by executive order, legislation, or voluntary action by the companies—so long as imports are cut back.

Indiana's Research

Top technical men of Standard Oil Co. (Ind.) family review their research accomplishments and plan ahead

FRENCH LICK, Ind.—How to conduct a research department, as well as current problems and accomplishments in petroleum research, were discussed at a week-long conference here of more than 200 technical men of Standard Oil Co. (Ind.) and subsidiary companies.

Charles A. Thomas, executive vice president of Monsanto Chemical Co., addressed the banquet which opened the sessions by discussing the function of a research department of a large corporation and the policies top management should adopt in order to get the greatest value from research.

The group then went into intensive review of the Indiana group's research work of the past year and made plans for the future. Subjects ranged from methods of building hurricaneproof drilling platforms in the Gulf of Mexico to methods of making new chemicals from petroleum.

In all, 73 papers were presented, the greatest number dealing with methods of making improved fuels and lubricants.

New products.—Among the developments discussed was a new cracking catalyst, described by W. R. Hertwig. The catalyst is of the silica-alumina type, but is superior to present commercial catalyst because it maintains its activity longer in service.

An improved detergent additive for lubricating oils was reported by L. W. Mixon. The new additive is particularly helpful with diesel fuels that are high in sulfur content and so require special lubricants.

A fundamental study of the nature of color bodies that may occur in catalytically cracked petroleum distillates was reported by R. H. Brown. It was found that the yellow substances present in freshly cracked products are apparently hydrocarbons of the fulvene type. The colored materials that form on storage proved to be organic compounds containing oxygen, sulfur, and nitrogen. Presence of four different types of material was found to be requisite for formation of gum, color, and sediment; these four necessary ingredients are oxygen, thiocresols, nitrogen compounds, and a fourth unidentified factor.

Latest steps in the change of grease-making from an art to a science were reported by G. V. Browning, who described electron-microscope studies of grease structure. It was found that the oil in a grease can be extracted without changing either the microscopic or macroscopic structure of the soap fibres. This technique greatly facilitates study of structure, and also makes it possible to replace the oil originally present in the grease with other liquids, for example silicones, which cannot readily be incorporated in greases by direct methods.

Improved scientific methods are also being used to guide utilization of industrial asphalts, it was pointed out by F. M. MacLaren. This widely used natural plastic is selected at present on the basis of rule-of-thumb appraisal. Current specification tests of softening point, penetration, ductility, and viscosity are inadequate to evaluate asphalt performance, MacLaren pointed out. New definitive performance tests have therefore been developed. They measure bonding strength (cohesiveness), flexibility, brittleness, and performance under torque. Additives for improvement of these properties are under development.

Growing use of the mathematical

Pictured here are 148 key technical men who attended the eighth joint technical meeting of Standard Oil Co. (Ind.) and its subsidiaries, at French Lick, Ind., recently.

KEY TO COMPANIES

I = Indoil Chemical Co.
PAS = Pan-Am Southern Corp.
PR = Pan American Refining Corp.
S = Standard Oil Co. (Indiana).
SOG = Stanolind Oil & Gas Co.
SPL = Service Pipe Line Co.
U = Utah Oil Refining Co.

First row: J. A. Ridgway, PR; P. E. Darling, PR; J. B. Duckworth, S; W. H. Hopson, SOG; J. E. Latta, SOG; J. F. Coffey, S; C. H. Oliver, Jr., S; S. W. Walker, SOG; T. H. Rogers, S; R. E. Wilson, S, chairman of board; B. K. Brown, PAS, president; H. F. Glair, S, general manager, manufacturing; L. W. Moore, PR, president; J. K. Roberts, S, general manager, research and development; R. N. Giles, S; F. J. Smith, PR; E. K. Brown, S; A. C. Hershey, S; D. L. Naef, S; J. A. Scobie, PR; R. F. Stahl, PR; L. Finch, Jr., SOG; T. G. Stack, S.

Second row: H. E. Fisher, S; W. L. Kennedy, SPL; A. H. Newberg, SPL; P. F. Hawley, SOG; J. E. Seebold, S; J. H. Rushton, Illinois Institute of Technology, consultant; W. G. Whitman, M.I.T., consultant; W. B. Littreal, U; R. A. Steel, S; H. M. Hart, S; P. R. Schultz, SOG; A. L. Conn, S; G. W. Schustek, S; R. V. Shankland, S; R. C. Gunness, S; A. S. Munneke, SPL; W. D. McEachron, S; M. T. Carpenter, S; A. W. Neeley, U; D. R. Isom, U; L. V. Durland, U; M. C. Hopkins, PR; W. H. Bahlke, S; R. E. Nelson, Jr., S; D. G. Zink, SOG; M. C. Hoffman, PAS.

Third row: E. Field, S; G. M. Webb, S; M. D. Gjerds, S; D. F. Benton, S, general manager of sales; B. L. Evering, S; E. L.

XUM

technique of statistical analysis in the planning of laboratory and pilot-plant experiments was described by P. C. White. Such analysis determines the contributions of a number of variables, and so permits several variables to be changed simultaneously, with a consequent reduction in the number of experiments that must be performed. Statistical analysis is also finding increased use in the planning of plant control tests and in the study of factors affecting the operation of plant equipment, Dr. White said.

Companies represented at the joint technical meeting were Standard Oil Co. (Ind.), Pan American Petroleum & Transport Co., Stanolind Oil & Gas Co., Utah Oil Refining Co., Pan-Am Southern Corp., and Indoil Chemical Co. Consultants were present from four universities—Purdue, Northwestern, Illinois Institute of Technology, and Massachusetts Institute of Technology.

Common mistakes. — Thomas' paper, which he called "Some Random Thoughts on Research Administration," discussed some of the mistakes business management is prone to make in dealing with research activities.

A good research group is apt to have a definite "personality" just like an individual, Thomas said, and works best as a team. For that reason, he declared, credit for accomplishments should go to the group rather than to any one member, and the group should not be broken up by reassignment to different types of work.

Too much money poured into a research project in the hope of immediate results often is more of a hindrance than a help, for successful industrial research has a high component of risk and requires patient financing, Thomas said. He also criticized the tendency to rush from the laboratory into construction of a commercial plant, saying that more thorough laboratory work, which is the cheapest part of a new plant or process, might save huge sums in pilot-plant experiments or in adjustments in a commercial plant.

Another common error cited by Thomas is emphasis on developing a new process and neglect of research into the end use of the product, with the result that many good processes have been commercial failures because it was discovered too late that the product was not entirely suitable for the intended market.

Best investment.—"The experience of American industry is that research is surely the best investment it can make," Thomas told the Indiana technical men. "There can no longer be any doubt that, by the application of a reasonable portion of income to well-administered research, industry cannot only buy itself an 'insurance policy' but, better yet, it can forge ahead."

NEXT WEEK

Annual Gulf Coast Number

The Journal's Annual Gulf Coast Issue is "built," in one respect, like every other weekly issue of the Journal. As such, there are articles and features involving every division of the industry—drilling, production, pipe line, natural gas, natural gasoline, and refining. In next week's issue, however, special emphasis has been placed on the Gulf Coast, that huge spread of territory sweeping some 1,500 miles from the tip of Florida westward to Brownsville, Tex., and the Rio Grande.

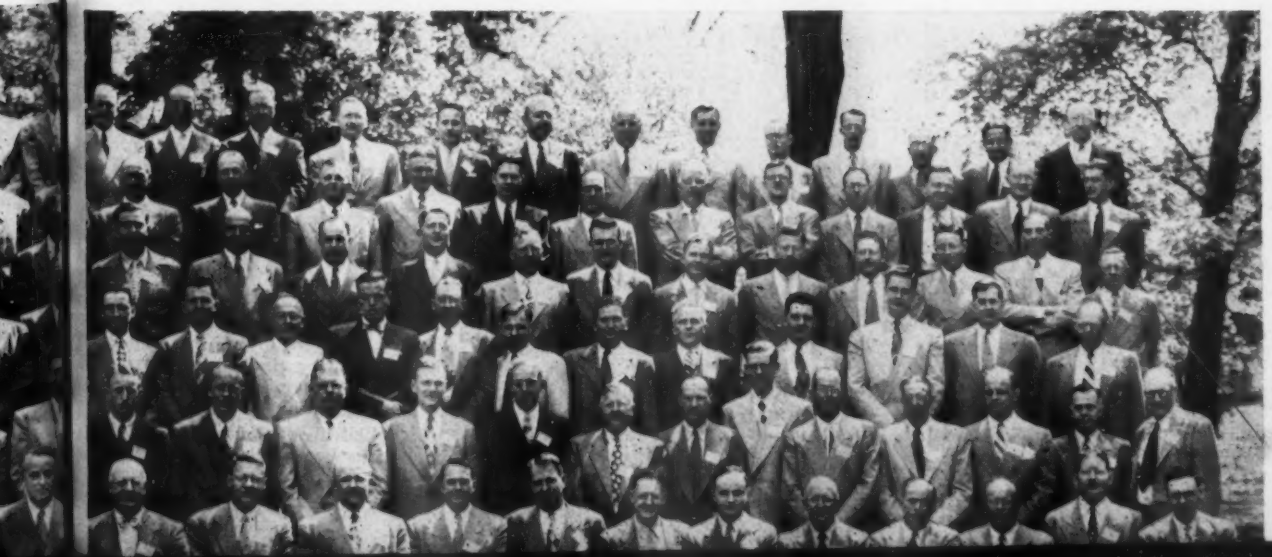
An imposing collection of recognized Gulf Coast experts have written a long list of special articles for the forthcoming issue, giving material heretofore not accessible or available. And drilling, production, and refinery men will appreciate the new copy of the 36 by 48-in. "all industry" multicolor map of the Gulf Coast area, which comes free with every copy.

Gordy, S; T. Redmond, S; H. S. Seelig, S; H. M. Steininger, S; G. R. Gray, S; F. S. Wood, S; A. P. Lien, S; C. H. Samans, S; P. J. Perille, S; R. R. Wilber, S; H. R. Snow, PR; W. B. Plummer, I, president; T. A. Abbott, S; F. C. Roop, S; H. R. Taliaferro, S; P. C. Livesay, S; H. C. Brown, Purdue University, consultant; C. F. Leydig, S; W. J. Tancig, S; A. H. Fox, S.

Fourth row: C. M. Loane, S; D. S. Warning, S; J. E. Kline, S; L. B. Gordon, PR; W. L. Webb, S; D. A. Monro, S; C. G. Kustner, S; E. W. Thiele, S; R. F. Marschner, S; W. R. Hertwig, S; E. L. d'Ouville, S; C. W. Peters, S; N. Fragen, S; R. J. Divoky, PAS; J. H. Forrester, SOG; M. F. Brown, S, manager; C. R. Harte, Jr., S; R. Diekman, S; J. M. Stuckey, PR; R. J. Hengetebeck, S; F. R. Walter, S; B. T. Allison, S; J. W. Yant, S; R. M. Eberly, S.

Fifth row: D. G. Schroeter, PR; E. R. Arbegust, PR; N. E. Lemmon, S; P. G. Stevens, S; I. H. Lutz, PR; C. J. Domke, S; G. T. Moore, S; H. R. Peterson, I; R. W. Gerhard, S; S. C. Bean, S; H. G. Schnetzler, S; H. V. Knight, S; R. B. Selund, S; F. V. Grimm, S; B. H. Shoemaker, S; D. L. Rankin, S; F. A. Gitzendanner, S; P. H. Sullivan, S; J. M. Miller, S; R. L. Burwell, Northwestern University, consultant; R. Gottschalk, S; L. W. Mixon, S; R. H. Brown, S; E. B. Tucker, S.

Back row: G. H. Weisemann, S; T. B. Tom, S; F. T. Wadsworth, PR; W. Kaplan, PR; I. C. Staeuble, S; M. Gordon, S; J. D. Walk, PAS; A. W. Lindert, S; J. W. Gaynor, S; P. L. Brandt, PR; W. S. Peeler, PR; I. W. Farriss, PR; C. F. Feuchter, PR; W. F. Meehan, S; R. C. Mallatt, S; A. D. Watkins, S; S. A. Montgomery, S; J. G. Housman, S; W. H. Congleton, S; D. P. Barnard, S; M. H. Arveson, I; J. A. Bock, S; J. W. Boatwright, S; W. P. Hilliker, PAS; E. W. Adams, S; R. B. Perkins, PR; R. H. Price, PR.



Rising Demand

Bureau of Mines forecasts domestic increase of 7.1 per cent, but declining exports hold down total demand

John C. Casper

DOMESTIC demand for petroleum products this year will be about 7.1 per cent greater than in 1949, according to the revised forecast of the Bureau of Mines.

Based on actual data for the first quarter, estimates from current figures for the second, and forecasts for the last half of the year, domestic demand for gasoline is expected to increase 5.6 per cent; kerosine, 11.0 per cent; distillate fuels, 16.1 per cent; and residual fuel, 4.2 per cent.

Continuation of the downward trend in exports is indicated by a projected decrease of 19.6 per cent for the year. Crude exports will be reduced 15 per cent and product exports will be down 21.3 per cent.

Losses in export markets for crude and products restrict the gain in total demand to 5.7 per cent.

Qualification. — The bureau's report calls attention to the fact that a considerable part of the relative gains in demand is due to abnormally low demand in 1949. Domestic demand in 1949 was only .3 per cent greater than in 1948, and total demand decreased.

Thus, domestic demand, forecast for 1950, represents an increase of 7.4 per cent over 1948, or an average annual increase of about 3.6 per cent for the 2-year period.

Domestic demand in the first half of 1949 was 3.2 per cent less than in the same period of 1948, and it is the comparison with this low level of demand in the early months of 1949 that produces the high percentage gains for the first half of this year. Domestic demand for the first quarter was 10.8 per cent greater than the same quarter last year. For the second quarter, the increase is estimated at 9.6 per cent. The forecast for the last half shows gains of 3.6 per cent and 4.7 per cent for the third and fourth quarters, respectively.

Fuel oils.—Higher demand for heating oils in the last part of the first quarter and early in the second quarter boosted first-half distillate demand well above last year's low level. Demand for the first 3 months was up 15.2 per cent.

The increase of 29.0 per cent for the second quarter represents a comparison between high demands this year when consumption was boosted by the late spring, and low demands last year when resellers and consumers made very few purchases for storage during the quarter.

Imports for the year are forecast at 762,000 bbl. daily, an increase of 120,000 bbl. daily or 18.7 per cent.

Refining.—For the first 6 months of 1950, crude runs are up about 1.3 per cent and demand for domestic crude is up only about .5 per cent from the first half of last year. There are two main factors that explain these small gains during periods of relatively large gains in demand. In the first half of this year, about 30,000,000 bbl. of product demand was supplied from accumulated stocks, compared with additions to storage last year amounting to 9,850,000 bbl.

Last year, refineries were operated at a relatively high level with surplus products going to storage. This year, product stocks were high enough to supply a portion of the demand and runs were held to a comparatively small increase. Also, product imports during the first half are expected to be about 24,000,000 bbl. greater than last year.

To have produced this material, mostly residual fuel, at domestic refineries would have called for additional refinery runs of about 100,000,000 bbl. on a basis of existing yields, or a smaller increase in runs with percentage yields shifted to produce more residual from each barrel of crude. To have produced this extra residual with no increase in runs would have required an increase of about 2.5 points in the percentage yield of residual.

The still smaller increase in demand for domestic crude was due to a gain in crude imports amounting to about 9,200,000 bbl. for the first half of the year.

BUREAU OF MINES FORECAST 1950 SUPPLY AND DEMAND
(Thousands of barrels daily)

	First quarter (actual)	Second quarter (est.)	Third quarter (forecast)	Fourth quarter (forecast)	1950 (forecast)	1949 (actual)	Per cent change
Supply:							
Production—							
Crude	4,921	5,110	5,280	5,290	5,152	5,042	+ 2.2
Other oils	481	458	478	511	482	428	+12.6
Total	5,402	5,568	5,758	5,801	5,634	5,470	+ 3.0
Imports—							
Crude	457	466	473	478	469	425	+10.4
Products	343	276	261	294	293	217	+35.0
Total	800	742	734	772	762	642	+18.7
Total new supply	6,202	6,310	6,492	6,573	6,396	6,112	+ 4.6
Stock change:							
Crude	—136	+ 13	.....	.....	—30	—9	
Other oils	—444	+126	+307	—155	—40	+2	
Total	—580	+139	+307	—155	—70	—7	
Demand:							
Total demand—							
Motor fuel	2,380	2,888	2,902	2,674	2,712	2,609	+ 3.9
Kerosine	431	222	217	402	318	288	+10.4
Distillate	1,430	816	750	1,283	1,069	932	+14.7
Residual	1,717	1,324	1,294	1,467	1,449	1,392	+ 4.1
All other	824	921	1,022	902	918	898	+ 2.2
Total	6,782	6,171	6,185	6,728	6,466	6,119	+ 5.7
Exports—							
Crude	72	88	81	65	77	90	—14.4
Products	191	195	185	174	186	237	—21.5
Total	263	283	266	239	263	327	—19.6
Domestic demand—							
Motor fuel	2,322	2,802	2,826	2,608	2,641	2,501	+ 5.6
Kerosine	424	218	212	397	312	281	+11.0
Distillate	1,395	797	728	1,261	1,044	899	+16.1
Residual	1,675	1,280	1,261	1,435	1,414	1,357	+ 4.2
All other	763	782	892	788	792	754	+ 5.0
Total	6,519	5,888	5,919	6,489	6,203	5,792	+ 7.1
Runs to stills	5,380	5,411	5,610	5,650	5,514	5,330	+ 3.5
Demand for domestic crude	5,049	5,099	5,280	5,290	5,181	5,048	+ 2.6

Holman Says Demand to Rise

LINDEN, N. J.—An increase in total domestic petroleum demand averaging 6 to 8 per cent above 1949 is anticipated for this year, Eugene Holman, president of Standard Oil Co. (N. J.), said last week.

Speaking before 1,600 stockholders at Linden, N. J.—an attendance which set a new record for such meetings in American corporate history—the Jersey Standard president said total demand for the first 4 months of 1950 is about 11 per cent above the corresponding period of last year.

He cited several factors contributing to the optimistic outlook for the

oil business. Among them were a strong current gasoline demand, colder spring weather in March and April increasing heating-oil demand by 35 per cent, record rates of home building and new car production, and the coal shortage earlier this year which added to residual fuel-oil demand.

By the end of this year, domestic oil production and refinery runs are likely to be 400,000 or 500,000 bbl. daily above the end of 1949, Holman said.

The stockholders' meeting was held in the 540 by 100-ft. boiler works building at the Bayway refinery of Esso Standard Oil Co. The stockholders and their representatives voted down a proposal to add three "outside" members to the company's board. The meeting lasted in all nearly 6 hours with an hour break for a company-sponsored buffet luncheon.

Grand Check Meeting

National Oil Scouts and Landmen's Association holds Oklahoma City convention; picks Beaumont for next year

Henry D. Ralph

OKLAHOMA CITY.—Two addresses on free enterprise and one on pitfalls in land titles constituted the bulk of the formal program of the annual convention of the National Oil Scouts and Landmen's Association here June 8-10.

For the most part, the 425 registrants, most of whom brought their wives along, were here to elect officers, have a good time, and renew acquaintances with their time-honored greeting: "How deep are you?"

The election of officers was both serious business and part of the good time. A new system was used for the first time, under which each scout check or district voted as a delegation as in a national political convention. Electioneering and fighting for proxies was brisk, and the credentials committee was in almost continuous session. The successful candidates are shown in the accompanying picture, and they were inducted into office by outgoing President S. N. (Red) Jackson, chief scout, Sun Oil Co., Dallas.

J. G. (Jack) Pew, a former scout now vice president of Sun Oil Co., Philadelphia, warned the association that the venturesome spirit of the men who built this nation is in danger of being lost in the welter of so-called security schemes now being advanced.

Formally, Pew said, "security" meant freedom to take risks and persue individual goals but now it is coming to mean being taken care of by somebody else. Unless we retain the type of risk-taking which drilled the Drake and many other oil wells, he added, the country may lose its entire set of values.

Much of the same thought was expressed by Dr. George L. Cross, president of the University of Oklahoma, who deplored the tendency to shift all responsibility to the federal Government. This, he said, may lead to nationalization of industry, because if any segment of the economy should bog down there would be a cry for the Government to take over. Dr. Cross suggested that one way to offset this would be for industry to finance more scholarships in courses in government and social science in order to develop executives with broad viewpoints.

William Gill, past president of the American Title Association, warned the association against pitfalls and tricky language in land titles, illustrating his talk with exhibits of curious legal instruments of the early days of this and foreign countries.

The association accepted the invitation of Beaumont to hold its next convention there in connection with the celebration of the fiftieth anniversary of the Spindletop discovery.

New officers of the National Oil Scouts and Landmen's Association: Front row, W. E. (Bill) Brown, Shell Oil Co., Houston, president; J. E. Winfrey, Gulf Oil Corp., Baton Rouge, first vice president; and Shelby T. Alexander, Magnolia Petroleum Co., Oklahoma City, yearbook editor; second row, R. R. O'Neal, Shell Oil Co., Midland, third vice president; and Cecil A. Darnall, Sinclair Oil & Gas Co., Albuquerque, secretary-treasurer; back, Gordon Asbury, Atlantic Refining Co., Abilene, second vice president.

GULF COAST

Depth Record

Mississippi wildcat now deepest Gulf Coast well

HOUSTON.—A Mississippi wildcat now coring below 17,000 ft. has broken the deep-drilling record for the Gulf Coast area.

At last reports the George Vasen 1 fee, SW NE 9-2s-11w, 2½ miles northeast of Wiggins, Stone County, was coring ahead below 17,000 ft. Previous record holder was the Phillips Petroleum Co. 3 Fannie Schoeppe, drilled on the Millican dome in Brazos County, Texas. It was drilled in 1944 and reached 16,655 ft. before abandonment.

The depth record for Mississippi up to this time has been held by the Superior Oil Co. 1 Cassie Bradford, 1-3n-13w. It reached 15,730 ft. before being abandoned as dry in June 1947. It tested noncommercial shows in the Lower Cretaceous.

It is reported that the Vasen well topped the Smackover lime above 17,000 ft. The test was spudded August 21, 1946, and was drilled to 11,209 ft. before being abandoned November 24, 1946. Drilling was resumed August 16, 1947, and hole was drilled to 14,038 ft. with open hole from the bottom of the surface pipe at 1,777 ft. to total depth.

The 14,038-ft. depth was reached in December 1947. In June 1948, 7-in. casing was run to 14,038 ft., perforated in several places, and tested. However, only small amounts of gas and salt water were reported being recovered. The perforations were then squeezed and the hole deepened to 14,415 ft.

However, a diamond core head and barrel were stuck at 14,385 ft. and could not be recovered. The hole was then plugged back and whipstock set at 14,115 ft. The hole has been diamond-cored in the sidetracked hole to its present depth.

The operators have not announced how much farther the hole will be carried. Drilling contractor on the job is Martin Harris Drilling Co.

Enlarged Refinery

New Houdriflow cracking unit gives Tide Water flexibility in handling variety of Mid-Continent or sour crudes

R. B. Tuttle

DRUMRIGHT, Okla.—The first single Houdriflow unit erected in the Southwest will soon be operating here, in the refinery of Tide Water Associated Oil Co. This unit, generally similar to the multiple-unit installation now operating in an eastern refinery, is rated at 4,500 bbl. per stream day, virgin-charge basis.

The new catalytic cracker is consolidated with Tide Water's other refining facilities at Drumright to provide an operational setup having wide flexibility. Currently rated at 12,000 bbl. daily input capacity, the refinery processes a composite Mid-Continent crude oil. Other principal processing equipment in the plant consists of an atmospheric distillation unit, a vacuum flash unit, and a thermal cracker.

Feed stock for catalytic cracking operations is obtained from the vacuum unit. Processing operations of this cat feed preparation unit consist of separating the bottom cut from the atmospheric unit into two streams. The vacuum unit overhead stream provides the cat cracker feed. It is about 29° A.P.I. gravity.

Corrosion resistant.—Design of Tide Water's Houdriflow unit incorporates corrosion-resisting materials for operation on sour crude oils. This feature of the new unit represents a relatively low additional investment over that for a unit in which corrosion-resisting alloys are not installed during its initial construction.

Over-all height of the cat unit is 240 ft. The catalyst lift pipe between upper and lower hoppers is 165 ft. in length and 20-in. in diameter. Constructed of ½-in., 4-6 Cr. material and insulated, the lift pipe operates at approximately 1,050° F. temperature. Operating pressure on the line is of the order of 10 psig. Expansion of the lift line, taken by a slip-type joint at its upper end, is about 16 to 18 in. at operating temperature.

Bellows-type expansion joints are installed in the catalyst lines between upper lift hopper and reactor, between reactor and kiln, and between kiln and lower lift hopper. The cat system is equipped with three slide valves. One is located adjacent to the reactor in the cat inlet line, another positioned in the 24-in. line between reactor and kiln, and the third installed in the regenerated catalyst line between kiln and lower lift hopper.

The upper lift hopper functions primarily to separate the synthetic, bead-type catalyst from the flue gas, the vehicle which moves it from the lower hopper. It also serves as a reservoir for hot catalyst entering the reactor. The upper hopper or, more correctly, the catalyst-flue gas separator, is 12 ft. in diameter by 55 ft. tall and is designed for 20 psig. although its normal working pressure is around 50 per cent of that figure.

The lower lift hopper is much smaller than the upper hopper since storage capacity is not needed. It is 6 ft. in diameter by 13.25 ft. in height. Regenerated catalyst from the kiln fed into this vessel is jetted by the flue gas through the lift pipe to the upper hopper. Like other sections of the hot catalyst system operating in the temperature region up to 1,100° F., the lower lift hopper is constructed of chromium alloy material.

The reactor is protected with a 12 per cent Cr. lining. All parts in the vapor-disengaging section and in the plenum chamber are made of 12 per cent Cr. material. The vessel proper is 14 ft. in diameter by 44 ft. tall.

The kiln, receiving the catalyst from the reactor, is refractory lined and is 17 ft. in diameter, with a height of 55 ft.

Cooling coils.—Five layers of hairpin type cooling coils are installed in the lower section of the kiln. These coils are fabricated from Schedule 80 alloy seamless pipe, 2⅞ in. o.d. The runs are spaced on 5-in. centers with 180° bends. Supporting beams for the coils are 12 per cent Cr. alloy and the tie bars are 25-12 Cr. Ni. material. Steam is generated in the coil at 290 psig., and is subsequently reduced at 175 psig. for plant use.

Basic flow and general arrangement of the new Tide Water cat unit follows that shown in *The Oil and Gas Journal, Refining Issue, March 23, 1950, page 174.* Synthetic crude from the cat operation at Drumright is fractionated in a column located nearby. Gas produced in the unit is concentrated in an adjacent plant. Girbotol treated in liquid phase, C_3-C_4 material is run to a U.O.P. catalytic polymerization plant.

Design yields based on charging 4,500 bbl. per stream day of 29° A.P.I. Mid-Continent vacuum gas oil fresh feed with 2,250 bbl. per stream day of recycle are:

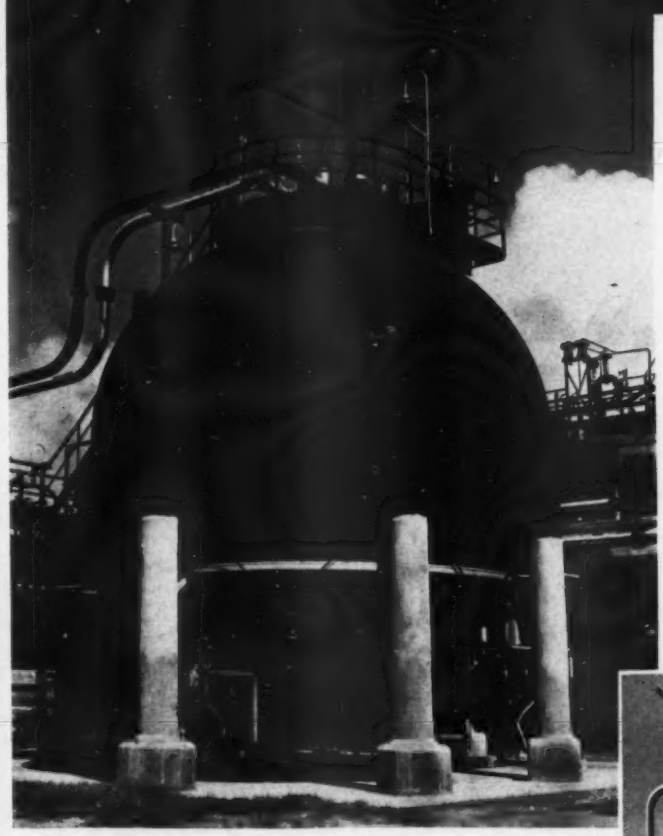
	Vol. per cent of fresh feed
Debutanized gasoline (79-80 CFR-M, clear)	50
Tractor distillate	8
No. 2 fuel	14
No. 3 or No. 4 fuel	4
No. 5 fuel	5
Total B-B	15

Circulation of synthetic silica-alumina (bead) catalyst will amount to about 250 tons per hour for a catalyst to oil ratio (V/V) of about 7.

Other Tide Water refineries.—In ad-

Tide Water's new 4,500-bbl. Houdriflow catalytic cracking plant. Equipment for processing C_3-C_4 material prior to its polymerization, including a Girbotol unit, is located left of the cracker's reactor-regenerator column in this view of the plant.

THIRD Electrosphere for desalting crude oil at Pan-American refinery

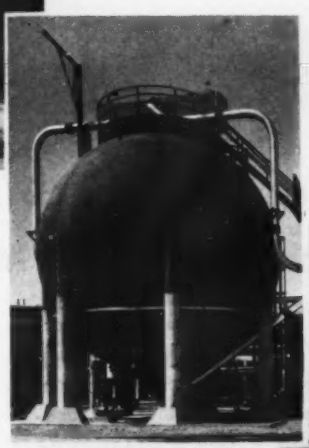


The 2,000-bbl. desalting Electrosphere shown at the left is the third such unit installed at the Pan-American Refining Company's Texas City refinery in the last 4 years.

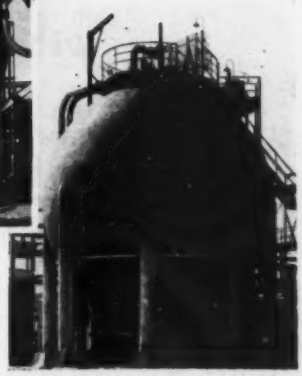
The Electrosphere is a combination of the familiar Hortonsphere and an electrical unit developed by the Petroleum Rectifying Company. In the de-salting process, the crude is heated and emulsified with water. This mixture flows into the Electrosphere where the water and brine particles are coalesced and separated out by means of electrical attraction.

The desalting spheres at the Pan-Am refinery operate at a temperature of about 220°F and about 5.5 per cent of water by volume is added. Here's what the company says about the process—"The net effect (of desalting) is to increase continuity of operation and reduce maintenance."

We are happy that the Hortonsphere is part of such an efficient process. The Hortonsphere's inherent advantages—low cost per bbl. of capacity and small ground area for large storage volume—make it the ideal container for this application.



Left: Electrosphere Number 2 was installed at Cracking Unit No. 2 in 1948.



Right: Electrosphere Number 1 was installed at Cracking Unit No. 1 in 1946.

Use as a *desalter* is just one special application of the Hortonsphere. In the oil industry, the Hortonsphere is generally associated with the storage and handling of highly volatile hydrocarbons like butane, butane-propane mixtures, and volatile refinery charging stocks. It has also been used for storing such volatile products as anhydrous ammonia, isoprene, and isobutylene.

Whenever you plan to desalt crude oil or store volatile hydrocarbons, you'll profit by using the efficient Hortonsphere. Write our nearest office for full details about standard capacities and working pressures.

CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3—2154 Healey Bldg.
Birmingham, 1—1536 North 50th St.
Boston, 10—1025—201 Devonshire St.
Chicago, 4—2128 McCormick Bldg.
Cleveland, 15—2204 Guildhall Bldg.
Detroit, 26—1514 Lafayette Bldg.
Havana—402 Abreu Bldg.
Houston, 2—2119 National Standard Bldg.
Los Angeles, 17—1523 General Petroleum Bldg.
New York, 6—3347—165 Broadway Bldg.
Philadelphia, 3—1615-1700 Walnut Street Bldg.
Salt Lake City, 4—525 West 17th South St.
San Francisco, 11—1254—22 Battery Street Bldg.
Seattle, 1—1325 Henry Bldg.
Tulsa, 3—1606 Hunt Bldg.

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ARMCO WELDED STEEL PIPE

ARMCO

The new Houdriflow plant and its auxiliary processes are controlled by the latest in remote systems. Both sections of the control boards are Panellit units. The flow scheme of the Houdriflow and Girbotol units are diagrammed on the panel shown left. The other processes supplementing the cat cracking operations are controlled from the section of the board shown right.

dition to the Drumright facilities Tide Water operates three other refineries. Largest of the group is its Associated, Calif., plant. Classified as a complete refinery, Associated facilities are geared to process 85,000 bbl. daily of crude oil. Other equipment at this plant includes a 34,100-bbl. per day thermal cracker, a 20,000 bbl. daily cat cracking unit, and processes for manufacture of alkylate and polymer.

The next largest Tide Water plant is located in Bayonne, N. J. This refinery, also classified as complete, is rated at 74,000 bbl. daily crude-oil input. Cracking facilities are divided in the ratio of 8,900 bbl. per day for thermal and 26,000 bbl. daily for catalytic. Production capacity on the refinery's polymerization unit is rated at 3,500 bbl. daily.

At Wilmington, Calif., the third largest Tide Water refinery has a capacity rating of 14,000 bbl. per day on crude-oil charge. In addition to crude-oil distillation facilities the plant is equipped with a vis-breaker rated at 8,200 bbl. daily.

Combined rating on processing facilities in Tide Water's four refineries is currently: Crude-oil charge, 185,000 bbl. daily; thermal cracking and visbreaking, 56,200 bbl. daily; catalytic cracking, 50,500 bbl. daily; alkylate production, 20,000 bbl. daily; and polymer production, 3,500 bbl. daily.

TECHNOLOGY

Octanes Versus Engines

Former S.A.E. president says it's time for automotive designers to curb their demands for higher-octane fuel

George Weber

DETROIT.—It is now the automotive industry's turn to do something about the mounting problem of increased octane requirements, R. J. S. Pigott, Gulf Research & Development Co., and a past president of the Society of Automotive Engineers, told members of the American Petroleum Institute's lubrication meeting here this week.

Engines could be redesigned to operate satisfactorily at a compression ratio of 12.5:1 on some premium gasolines now available or soon to be made available at present octane trends, he said. Moreover, Pigott stated such design changes would cost automobile manufacturers only 10 to 20 per cent as much as the petroleum industry would need to expand in order to raise the octane number to the level which would be required if compression ratios of present-type engines were to be jumped to 12.5:1.

Pigott, presenting a paper entitled "Compression Ratio, Octane Demand, and Lubrication," said:

"The best of premium gasolines perhaps reaches 92-93 octane number and may shortly become fairly general at 95. It would take 15 additional octane numbers to take care of 12.5:1 compression ratio in any production design that has so far been tested; and the housebrand gasolines would have to go up about 25 numbers. It should be quite obvious that the oil industry is not going to be able to produce so much increase in chemical octane, and therefore it has got to come, at least in most part, from changes in the engine."

Cites high costs.—On the basis of studies conducted by Eugene Ayres of Gulf Research and W. M. Holaday of Socony-Vacuum Oil Co., Inc., Pigott estimated that to increase 10 octane numbers by refining would cost the oil industry as a whole somewhere between 2 billion and 3 billion dollars. To get equivalent reduction in octane demand on the engines, however, would appear to be something on the order of 300 million to 500 million dollars for the automotive industry, he said—in effect not a great deal more than would be required over the period of change for ordinary new models, since most of the cost of the changeover is going to be tooling in any case.

Detonation causes.—Since temperature is probably the principal agent inducing detonation at the end of compression, the factors which influence temperature were listed as:

1. Compression ratio.
2. Turbulence.
3. Intake temperature of mixture.
4. Effectiveness of jacketing, especially the head.
5. Imperfectly cooled reentrant corners that appear in most of the L-head engines.
6. Hot exhaust valves.
7. Piston-head temperatures.
8. Residual gases.
9. Manifold distribution.

Reviewing these factors, Pigott pointed to numerous engine improvements developed here and abroad, which have lowered octane demand appreciably. He does not accept as final the answer of a major automobile manufacturer that tests of these proposed improvements show them unsatisfactory. For one thing, he said, in spite of our claims to being ahead of the procession in all matters of design, it is certainly true that the average engine designer, like a great many other engineers, does not like to be shown up as having produced something less than the best design.

Changes possible.—While Pigott made no specific recommendations as to what engine changes should be made, he reviewed as possible the following: increased combustion-chamber turbulence, better jacketing and head cooling, liquid-piston cooling, im-

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proved manifold design, supercharging, and a satisfactory substitute for the poppet valve. He concluded that "since we shall not be likely to get compression ratios much higher than 12.5:1 for a long period of time and since the engine designer can take up most of the slack on octane while the oil industry is doing what it can to raise the octane value, it will be absolutely necessary that the automotive industry take over this task."

Other representatives of both the petroleum and automotive industries participated in the meeting. Maj. Gen. James H. Doolittle, vice president of Shell Oil Co., discussed "The Automobile and Petroleum Industries, Partners Before the Public;" and G. A. Round, chief automotive engineer with Socony-Vacuum, presented a paper on "Automatic Transmissions and Their Service." "Engine Design and Its Relation to Fuels and Lubricants" was the subject of a paper by Victor G. Raviolo, assistant to chief engineer in charge of engine development, Ford Motor Co.

Process Heat

Refinery engineers hold seminar on methods of using, measuring, and recovering large quantities of B.t.u.'s

R. B. Tuttle

TULSA.—A new technical program, the first annual "Process Heating Seminar" just barely beat the hot weather season here last Saturday. That timing probably was a good thing, because the 130 refinery-process engineers in attendance discussed the best handling of B.t.u.'s, in multi-million-unit lots, in many aspects as to refining and process-plant utilization.

The seminar was sponsored by John Zink Co. in the interests of better engineering and operating practices for refineries and process work. Attendees were from engineering and operating groups both in the Southwest and other parts of the United States.

Technical papers included: "Metallurgy for High-Temperature, High-Sulfur-Process Conditions" by Francis Fahrenwald, Fahralley Corp., Harvey, Ill.; "Performance of Thermal Poly Trans-Economizers," by J. H. Smith, chief process engineer, Continental Oil Co., Ponca City, Okla.; "Economics of Waste-Heat Recovery," by L. D. Stewart, process engineer, Mid-Continent Petroleum Corp., Tulsa; "A New Approach to Design for Radiant Heat Transfer in Process Work," by Robert Reed, chief engineer, John Zink Co.

Waste heat.—The refiners' discussions emphasized the care they were taking to utilize all heat generated in combustion processes, and in recovering and applying heat formerly wasted. Stewart's paper on waste-heat recovery was illustrative of the character of the meeting. He summarized various methods for recovering waste heat, whether the problems were in initial design or in proposed operational changes, as follows:

1. Use low-pressure steam for heating or process where possible, in existing equipment.

2. Increase the operating efficiency of furnaces and heaters by keeping the excess air to an operating minimum.

3. Install economical heat exchange to save cooling water and fuel (a) between oil streams, (b) with waste-heat boilers, utilizing oil or flue gases.

4. Utilize exhaust steam, with the addition of new equipment, as (a) superheat, and use for process as in oil strippers, (b) use for power drives, or in low-pressure turbines, (c) use for refrigeration, as in the absorption-type unit or with multistage centrifugal compression, (d) heat boiler feed water with exhaust steam, or condense and return it to condensate, where practicable.

5. Miscellaneous and future developments: (a) determine the economical relation between the amount of steam and vacuum to use in a vacuum unit, (b) establish optimum thickness of insulation, (c) use semiheated cooling water from one unit effluent for another, where applicable, (d) install good steam traps on steam heaters, so that only steam-free condensate will be discharged, (e) develop centrifugal compressors to economically handle vapors at high discharge pressures, to avoid condensing and liquid pumping when transferring to another heated process.

Radiant heat.—Reed said in his discussion on design for radiant heat: "We believe we have found the answer in the manner in which furnace gases circulate in the heater and the influence of furnace design on the manner in which the gases circulate. Common understanding as revealed in countless discussions with men who design and operate furnaces presumes that the gases resulting from combustion flow more or less directly, if gently, toward the point of exit from the furnace. In this course it is presumed that there is a progressive loss of heat so that the gases arrive at the bridgewell or point of exit at a temperature as indicated there.

"In point of fact it is to be agreed that the temperature indication at the bridgewell is correct but the means for reducing the temperature does not, according to the evidence we have gathered, lie in the gentle but direct flow toward the point at which the temperature is taken. The flow is not all direct as very large portions of the gases are detoured in their courses by forces characteristic of furnaces and are caused to recirculate."

Performance data on the trans-economizer bank serving to transfer 23,500,000 B.t.u. per hour with only 350 sq. ft. of surface made up Smith's paper.

Concluding his discussion on high-temperature steels, Fahrenwald said: "There are a great many considerations that have to be given to the selection of the proper alloy for a given condition. In a good many cases, of course, it is almost impossible to accurately predict a reaction of a given alloy to a set of conditions. In such cases it is necessary to rely on past experience, and we feel that the alloy manufacturer who has, necessarily, a great backlog of such experience, can be of tremendous benefit to all industries in the proper selection and the proper application of these alloys to the particular problems at hand."

Panel of experts at the John Zink Co. seminar on process heat: J. B. Bellah, Refinery Engineering Co., Tulsa; Joe L. Parker, Girdler Corp., Inc., Tulsa; Sidney Born, Born Engineering Co., Tulsa; Davis Read, Universal Oil Products Co., Chicago; D. F. Gerstenberger, Alcorn Combustion Co., Tulsa; T. B. Leech, Petro-Chem Development Co., Inc., Tulsa; L. B. Sutherland, C. F. Braun & Co., Alhambra, Calif., and F. Duane Fuqua, Koch Engineering Co., Inc., Wichita.

PAIR OF POWER PACKAGES

Two INTERNATIONAL Power Units Supply Water and Electricity for Drill Rig

The Crow Drilling Co. used two International U-2 Power Units on their drilling operation in the Spirit Lake field near Lewisville, Ark. One unit pumps water and the other U-2 and generator supplies electricity to the rig.

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Canadian Associates: BRANDON, MANITOBA, Canadian Brown Steel Tank Co., Ltd.

Shell's Recovery

The Group's far-flung production, refining, and marketing activities are now back to prewar share of world total

Dahl M. Duff

CRUDE OIL and natural gasoline produced or held under long-term contract by the Royal Dutch-Shell Group last year averaged approximately 1,040,000 bbl. daily, a gain of 8 per cent compared to the previous year.

The volume of oil processed in the group's refineries throughout the world was approximately 1,080,000 bbl. daily, an increase of some 12 per cent over the previous year.

This and other data were given in the annual report of the Royal Dutch Petroleum Co. This company holds 60 per cent interest in the Royal Dutch-Shell Group with Shell Transport & Trading Co., Ltd., holding the remainder.

Production and oil held under contract by the Group last year amounted to 10.7 per cent of the world total. The report commented that following a decrease during the war the Group's relative share of the world total has now regained its prewar proportion.

The increased refinery throughput in 1949, the report said, is mainly due to the fact that several of the refineries which in 1946 were inaccessible or out of commission as a result of the war have since been brought back into operation. "The requirements of the sales organizations can now be met to a greater extent than before from products manufactured in plants owned by Group companies."

Regulation deplored.—Discussing generally the current position of its worldwide organization, the report deplored the network of regulations which today seriously hamper international movement of capital and labor. Such restrictions on trade, mostly imposed during the war, tend to be maintained longer than is warranted by circumstances, to impede the natural development of the market and "in the final analysis to delay economic recovery."

"A further point . . . arises from the facility with which oil as a commodity can be taxed," it said. "The ease and low cost to governments of levying taxes on petroleum products and collecting such levies through the oil industry has tempted many throughout the years to single out these products as a means of raising revenue cheaply. However, with the ever-increasing place of petroleum products in the life of every nation, the effect of such taxation can only be to increase the costs of all goods, with a more immediate impact upon the economy of the country than almost any other form of taxation."

Another problem confronting the industry today is in the substantial additional working capital required. Higher working-capital requirements arise out of the large stocks of construction and operating materials necessary, the carrying of heavy stocks of petroleum itself, and the higher taxation of products. In general, the report said, the lapse of time between the production of oil and the receipt of proceeds from the sale of products derived from it is in excess of 6 months.

Highlights given.—The report gave a country-by-country review of the highlights of activities in the fields of exploration, production, and manufacturing. The developments listed included the following:

Despite heavy production during the year, the Group's reserves at the end of the year were estimated to be higher than at the beginning. Although exploration was discontinued in New Brunswick, Canada, and in Ecuador, exploration is continuing in countries where production is now obtained as well as in Canada, Nigeria, British Somaliland, and Australia.

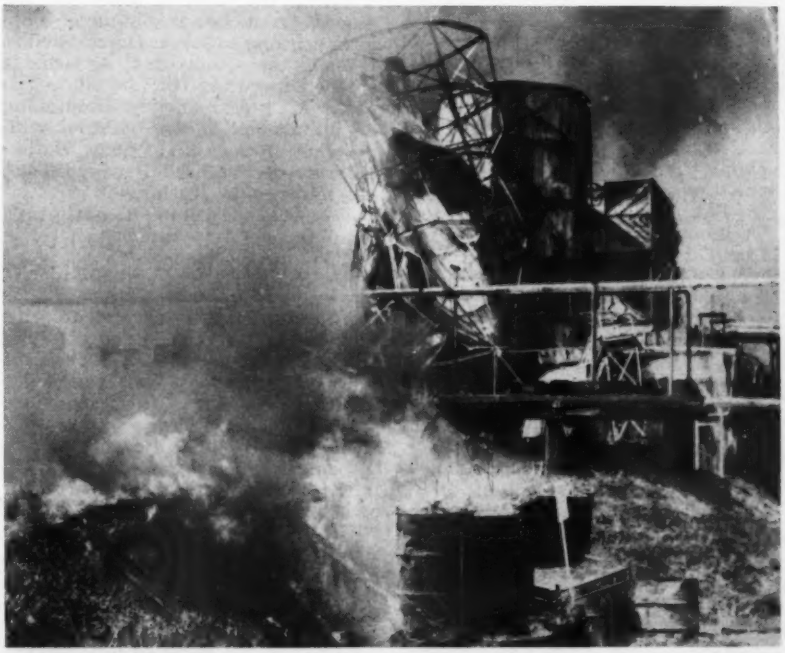
Venezuela. — Exploration was concentrated almost entirely in the western part of the country. Development work has now settled down to a level which, though somewhat reduced, is more than sufficient to enable the natural decline in production to be offset. The Cardon refinery last year processed nearly 12,000,000 bbl. of crude after it went into operation in February.

Colombia.—Proved reserves of Casabe field have been increased, and the potential production raised by about one-third. Production was continued below the potential awaiting additional capacity in the pipe line to the Caribbean.

The Netherlands. — Exploration is being energetically pursued. Gas has been discovered, but it will be some time before the extent of the free gas reserves can be established. The Pernis refinery processed about 21,700,000 bbl., including 4,300,000 bbl. from Schoonebeek.

Egypt.—The petroleum legislation of 1948 continues to be a subject of negotiation with the government. Exploration is continuing on a reduced scale. Production in the Sinai Peninsula is believed to have now reached its maximum.

The Middle East.—Iraq Petroleum Co., Ltd., in which the Group has a 23.75 per cent interest, made "notable discoveries" of oil in the Basrah



How the Balik Papan refinery of Bataafsche Petroleum Mij. looked when the Japanese surrendered Borneo, illustrating the postwar reconstruction task of the Shell Group.

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concession, and the examination of the deeper horizons of Qatar also was successful. Under its contract with another major Middle East producer (Gulf Oil Corp., half interest holder in Kuwait), Royal Dutch-Shell last year obtained 32,000,000 bbl. of crude.

Pakistan, India, and Burma.—The Shell company concerned in this area was reluctant to accept certain provisions in the petroleum legislation of Pakistan and therefore withdrew from this joint venture with two British companies. Somewhat similar considerations caused its withdrawal from India and Burma.

Netherlands Antilles.—A second plant for the manufacture of sulfuric acid came into production in Curacao.

British Borneo.—Seria's proven reserves were substantially increased as a result of successful stepout drilling. Production from this area has been increased considerably.

Indonesia.—It became possible to resume exploration near Medan in North Sumatra. Exploration was undertaken in the coastal areas of Borneo north of Balikpapan and on the island of Tarakan. On the island of Bunju near Tarakan exploration followed by deep drilling gave promising results. It also was possible to begin an exploration program in the areas belonging to a Group company in Djambi. In the Tjepu area of Java, work progressed sufficiently to enable regular production to be obtained from Kawengan field.

In manufacturing in Indonesia, rehabilitation of the Pladju refinery reached its final stages. A fifth distilling unit was brought on stream, and throughput was increased substantially. Satisfactory progress was made in reconstruction at Balikpapan, and work was started on rehabilitation of the distilling unit at Tjepu.

Tanker tonnage controlled and chartered by Group companies at the end of the year surpassed 4,000,000 deadweight tons. A major development in the Group's marketing activities was the reduction to "small proportions" of the trade with China. "At the moment the pattern of international trade is still very obscure, but we believe that in due course the demand for oil products in the Far East will revive," the report said.

Sterling Accord Emerging

Individual company agreements on dollar-oil controversy may establish pattern for ending Anglo-American dispute

Dahl M. Duff

A NETWORK of individual agreements covering different companies and different areas of operation appears to be emerging out of the American-British negotiations on the sterling-dollar oil problem.

Standard Oil Co. (N. J.) and Socony-Vacuum Oil Co., Inc., have worked out a complicated currency plan with the British Government involving the marketing of these companies' share of the production of Iraq Petroleum Co., Ltd.

A group of officials of California-Texas Oil Co., Ltd., headed by W. H. Pinckard, chairman of the board, left New York last week by boat for London to resume negotiations with the British. Some understanding for this company was expected to result from these new discussions.

These two developments, coupled with the earlier Standard-Vacuum Oil Co. agreement and the Jersey Standard-Caltex arrangement which ended gasoline rationing in Britain, indicated that separate deals, rather than any broad over-all settlement, will be made to ease, for the time being at least, the sterling-trading difficulties of the American oil companies.

Caltex, a major refining and marketing company throughout the Eastern Hemisphere, was understood to be anxious to come to terms on some acceptable basis with the British. If a Caltex agreement materializes, a major remaining question would be that of the dollar-oil production of Arabian American Oil Co. The bulk of Gulf Oil Corp.'s share of the Kuwait production is sold under long-term contract to Royal Dutch-Shell.

While these individual agreements are being worked out, the State Department presumably is continuing its discussions of the question with the British now that Victor Butler, Ministry of Fuel and Power official, has returned to Washington with an answer to the State Department's counterproposal to the British "sterling incentive scheme."

I.P.C. oil.—The new Jersey Standard-Socony-Vacuum agreement with the British Government covers only oil obtained from the 23.75 per cent share held by those two companies in Iraq Petroleum. This company's output, including Qatar, is currently about 140,000 bbl. daily, but priority is being given to the expansion of this production by the construction of a big-inch pipe-line outlet.

The agreement for marketing the American share of this production provides different plans for sales within and outside the sterling area. In the case of oil outside the sterling area, the American companies are allowed to pay I.P.C. 75 per cent in sterling and the remainder in dollars or dollar-equivalent currencies. In selling the oil, they can accept sterling in the same proportion.

Under the existing arrangement among the Iraq Petroleum shareholders, each lifts its share of the production at a cost price plus one shilling. The terms of the new British Government agreement with the two American companies, as reported, indicate they will acquire certain sterling in trading profits which is to be used for purchases in the sterling area.

The other part of the agreement concerns that part of the American share of the I.P.C. oil which is sold in the sterling area itself. For this oil, the American companies agreed to allow the full trading profit to accrue to a British subsidiary. This British subsidiary will be subject to the stiff British corporate taxes. The net profit of this company remaining after taxes will be allowed the parent companies in dollars.

It was not clear whether this subsidiary would be a new company, though there were indications it would be a agency of Near East Development Co., the present Delaware corporation through which Jersey Standard and Socony-Vacuum now hold their joint interest in Iraq Petroleum.

No full and official statement of the terms of this new agreement was made either by the British Government or by the companies themselves. Its main provisions were unofficially reported in New York, and in general outline confirmed in London.

Government officials in Washington said the two American companies were "very satisfied." The British ministry said the plan was in accord with its policy of reducing the dollar drain for oil wherever possible. It said the American share of the I.P.C. production entering the sterling area had heretofore been paid for in dollars, and that the new taxation arrangement would result in a slightly smaller number of dollars leaving Britain.

Third countries.—As far as sales outside the sterling area are concerned, the Iraq agreement appeared to be particularly significant in that it allows for the first time limited trading in sterling by American companies in these so-called "third countries." One of the principal complaints of the American oil companies has been directed against Britain's bilaterial trade agreements which have cut into American sales outside the sterling area. The American companies have contended they were not able to compete on a equal basis with the British companies since they could not accept sterling.

Like the earlier agreement ending rationing in Britain *(The Oil and Gas Journal, June 1, page 40)*, the new plan for the Iraq production was termed another encouraging and significant step leading to full settle-

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ment of the currency problems hampering the international oil trade. There were, however, other comments that the British had taken advantage of competitive fears of the several American companies in order to "knock them off one by one."

Paradox.—Some interesting comments on the sterling-dollar oil situation were made recently by the London Economist. Referring to the offer of Jersey Standard to supply additional motor fuel for sterling, thus allowing the ending of rationing in the United Kingdom, the Economist said a curious situation had arisen whereby the additional motor fuel would cost Britain some dollars if it is sterling oil but would not cost dollars if it is dollar oil.

This is due to the fact that the major share of the additional consumption will be met by the British companies, a substantial part of whose costs are in dollars. Jersey and Caltex, on the other hand, are meeting their part of the additional consumption entirely against sterling payment.

"This being so, the Americans can at least consider themselves safe against any British hankering after still more substitution," the Economist commented. "No doubt they will persist in their efforts to get the substitution policy withdrawn altogether."

"Their purpose (that of Jersey Standard in making the offer) is not difficult to see," the Economist said. "An expansion of the total market will allow them to hold a larger trade than they would otherwise have held in the interim period until the Fawley refinery and other American arrangements for supplying oil to the sterling area at sterling cost, can take effect.

"Further the Jersey Standard representatives were no doubt anxious to devise some way of relieving the hitherto unbroken failure of the Anglo-American oil talks and creating a better atmosphere. . . . Their offer was astute as well as imaginative, and one that a hard-pressed government would not find it easy to turn down."

Britain Sends Answer

WASHINGTON.—Britain's long-delayed answer to the last proposals of the State Department for settlement of the dollar-sterling oil controversy finally reached Washington last week with return to this country of Victor Butler, undersecretary of the Ministry of Fuel and Power.

Informed sources said the note dealt rather extensively with both the latest agreements and previous ones under which gasoline rationing was terminated, and the British appear to believe that these arrangements offer something of a pattern on which the whole controversy can be settled.

The new "proposals," it was said, were so worded that extensive study will be required to determine just what is offered, but on first reading, it was intimated, officials here did not feel that much progress had been made toward a solution of the problem. It is not considered in Washington that the several agreements entered into by the British with the companies have done any more than dispose of some "fringe" questions which might have beclouded but did not affect the main issue.

It is understood that the British note is concerned with the immediate questions arising out of the order supplanting dollar with sterling oil, whereas the State Department, while anxious to settle that matter and regain for the American companies some, at least, of the business they have lost is equally concerned over the long-term aspects and is seeking from Britain an agreement that will not only settle the position of the companies in the sterling and other non-dollar areas but will prevent a recurrence of the present situation.

Two Records

Venezuela, Saudi Arabia production at new highs

NEW all-time highs in crude-oil production have been established in Venezuela and in Saudi Arabia.

For the first time in history, Venezuelan production has gone above the million and a half barrel daily mark. During the week ended May 29, output averaged 1,512,700 bbl. daily.

Most of this represented replenishment of storage which was drawn down during the week-long strike early this month. It is anticipated that Venezuelan production will soon drop back to around 1,425,000 bbl. daily and possibly held at this relatively high level due to improved demand.

In the week ended May 22, Venezuelan production reached 1,497,900 bbl. daily. This surpassed the previous daily average for a single week, that of January 1 this year when production was 1,497,800 bbl. daily.

Venezuelan production the week ended May 1 was 1,433,400 bbl. daily. Because of the strike this dropped to 686,700 bbl. daily the week ended May 8. The strike was largely over by May 10, but cleaning out of some wells and other difficulties held production to 1,192,000 bbl. daily the week ended May 15.

The Saudi Arabian production record was 550,911 bbl. daily during the month of May. This contrasts with a previous high by Arabian American Oil Co., of 532,300 bbl. daily in February of last year.

Aramco's production has fluctuated considerably over the last year, largely due to currency and exchange difficulties connected with marketing this dollar oil.

The record May output by Aramco brought its production for the first 5 months to an average of 474,519 bbl. daily. During May, the Ras Tanura refinery ran an average of 75,068 bbl. daily for a 5-month average of 85,884 bbl. daily.

EUROPE

New Austrian Production

Reports from Austria indicate the Soviet Mineral Oil Administration has developed production of about 1,000 tons, or 7,000 bbl., daily in the Matzen area northeast of Vienna.

The reports referred to highly productive wells at Gaenserdorf, which is about 25 km. from Vienna and about 15 km. from the older fields in the Zisterdorf area. Gaenserdorf is near Matzen where the Russians began drilling several years ago on a structure mapped prewar by American and British interests.

It was said that the production and development of the new producing area is controlled by special authority from Moscow and not by the same group in charge of other Russian-held oil properties in Austria. Russia continues in control of most of Austria's oil as a result of failure to agree on terms of an Austrian treaty. In the case of the new producing field, it was reported that 60 per cent of the present 1,000-ton daily production is taken for the exclusive use of the Russians.

The Soviet oil organization also is reported to have developed some oil production in a new well in Aderklaa field about 10 miles from Vienna. This field has been rated heretofore as a gas reservoir with a few barrels of condensate.

MIDDLE EAST

Iranian Royalty Advanced

Anglo-Iranian Oil Co., Ltd., has advanced the sum of £6,000,000 ($16,800,000), free of interest, to the Iranian Government against the current royalty account.

Reports from Teheran indicated the government would use the money in connection with its ambitious 7-year economic development plan. The Iranians also are hoping for financial assistance from the United States Government in addition to the military supplies now being received.

Loans by oil companies to governments against royalties have been made previously. However, the Iranion parliament has failed to ratify an agreement between the government

and Anglo-Iranian under which royalty and other payments would be approximately doubled to more than £18,500,000.

No immediate action which would break the parliamentary stalemate appears to be in prospect. The agreement would be retroactive to January 1, 1948, and the company has been maintaining reserves to make payments on the new scale. The royalty and other payments under the new agreement would total about 17s 5d per metric ton, or the equivalent of about 32.5 cents a barrel. An official of the company in Teheran recently said this would be the highest made by any major operating oil company.

LATIN AMERICA

Barbados Opened

Exploration concessions sought under new law

A NEW petroleum act vesting oil rights in the Crown has been placed in effect in the British West Indies colony of Barbados, and the colonial government is now negotiating with oil companies for the grant of exploration licenses.

The companies involved in the negotiations have not been officially identified. However, Gulf Oil Corp. is reported interested in the island's possibilities, and Trinidad Leaseholds, Ltd., in its last annual report revealed a joint company was being formed with Central Mining & Investment Corp., Ltd., and British Union Oil Co., Ltd., for exploration in Barbados.

The 166-sq.-mile British island northeast of Trinidad has had production of a few barrels daily for the last 20 years. Geological opinion on its prospects varies. Trinidad Leaseholds and its associates completed a gravimetric and aerial survey, and this company pointed out that lease terms must be such as to justify the heavy expenditure necessary for deep drilling. The company said application had been made for a concession and that exploration would be undertaken if this was granted.

The new petroleum law approved by the island's general assembly leaves specific details of licenses and leases to the Governor-in-Executive Committee. This committee is empowered to make regulations dealing with licenses and leases. Either house of the legislature can annul the regulations within a period of 40 days after they are presented.

Law's effect.—The main effect of the new law is that it vests all petroleum rights in the government, and requires government licenses and leases for exploration and production. The only significant provision set out for the licenses and leases is that the royalty will be determined by the Governor-in-Executive Committee in no case at less than 10 per cent.

The law gives the general procedure for arbitration of disputes arising under its provisions. For example, arbitration is called for in disputes over the selling price of crude in calculating the amount of royalty.

For the owners of the land, the law provides for the formation of hexagonal 100-acre pooling areas in which the landowners receive their proportional part of a total of 25 per cent of the royalties payable. All royalties go into the public treasury, and these petroleum-quota payments to landowners are made out of it.

Another section relates to compensation for existing lessees and royalty owners. This is specified as equal to the amount which could have been realized in an open-market sale. The legislation also authorizes a commission which will grant necessary surface rights for the lessee or licensee if they are not practicable to obtain by private arrangement with the property owner concerned.

Of interest is the fact that the provisions of the law are specified as applicable to submerged areas, thus including offshore territorial waters. It repeals Barbados' old mines acts of 1904 and 1908.

Mexican Pickup

Refinery runs, drilling, production ahead of 1949

WASHINGTON. — Mexican crude production during first quarter of this year was at the highest level in a generation and 26 per cent ahead of the corresponding quarter in 1949, it was announced by Petroleos Mexicanos last week through its Washington information service.

Sen. Antonio J. Bermudez, director general of Pemex, said also that 33 per cent more wells were drilled in the first quarter and 60 per cent more footage than last year.

Statistics issued by Bermudez showed that crude production for the first 3 months of 1950 was 16,709,789 bbl. against 13,274,776 bbl. in the first quarter of 1949. Distillate production fell to 8,756 bbl. from 15,102 bbl., but gas output, figuring 5,000 cu. ft. as the calorific equivalent of a barrel of oil, rose to 2,464,324 bbl. from 2,084,356.

Bermudez reported that refinery runs increased to 15,077,087 bbl. from 13,722,034 bbl. last year. The number of exploration wells drilled was only three as compared with five in 1949, and their footage was 25,500 as compared with 35,453, but the number of development wells increased from 25 to 37 and the footage from 74,091 to 150,127 ft.

Direct operations by Pemex currently account for about 95 per cent of total production, Bermudez said, with the remainder representing oil produced by Mexican and foreign companies which drill under contracts with Pemex.

Sabalo Claim Rejected

Sabalo Transportation Co.'s $300,000,000 claim against the Mexican Government has been denied by the Supreme Court in Mexico City.

The company had sought this sum as recovery for its loss from Mexico's action in breaking a drilling contract. Sabalo, controlled by Sam Katz, Mexico City, before expropriation in 1938 held a contract covering part of Poza Rica which was later developed by Petroleos Mexicanos.

CANADA

Bright Future

1958 may see Canadian crude ample for needs

THE bright future of the Canadian oil industry and the benefits of its development for the economy of western Canada were described last week in New York by H. H. Hewetson, Imperial Oil, Ltd., chairman, in a talk before the New York State Chamber of Commerce.

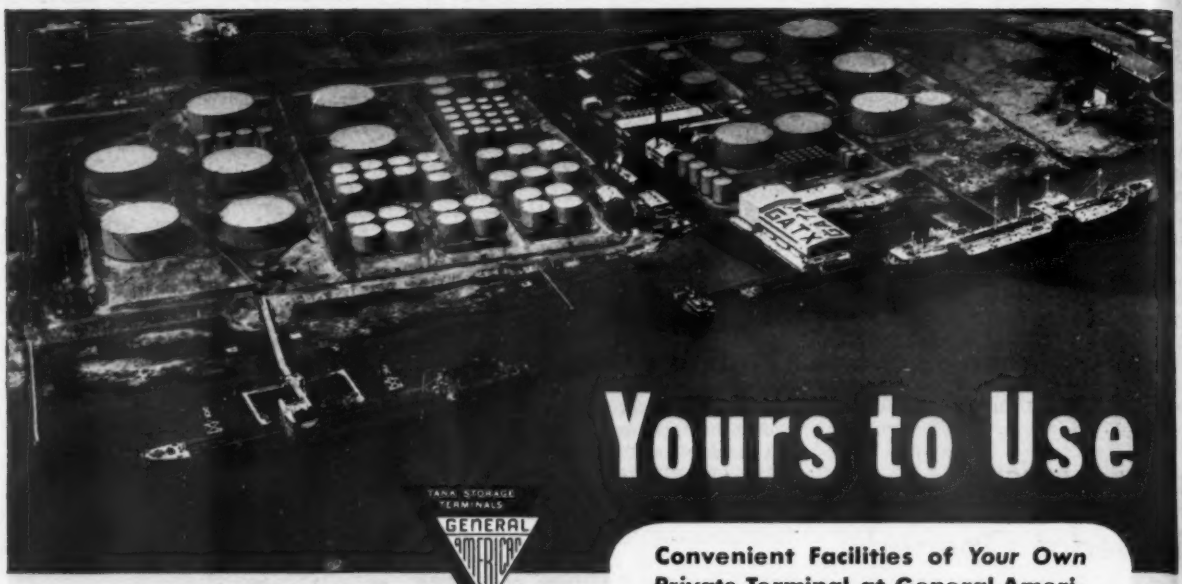
By 1958, Canadian crude production could amply meet Canada's total consumption if, as expected by some geologists, a total in excess of five billion barrels is proved up in the Interior Plains region of western Canada, Hewetson said.

As in the United States, a healthy competitive industry is making this production possible in Canada. More than 40 oil companies of various size, plus hundreds of individuals, are now looking for oil on the Interior Plains, Hewetson said. There are 33 refineries operating in Canada, owned by 17 different companies.

Exchange oil.—The Imperial chairman said that in the long run it may be to the advantage of both the United States and Canada—economically and geographically — to exchange crude with each other rather than to haul oil to markets at great distance from sources of supply. He referred to the possibility of a movement of western Canada oil to the United States midwest against shipment of United States oil to other parts of Canada.

The search for oil in western Canada prior to the Leduc discovery in February 1947, he said, represents a perfect example of the "pioneer spirit and of the risks private capital has shouldered all over the world to find oil. During a 25-year period, Imperial spent an average of $1,000,000 a year, drilling a total of 134 dry holes.

XUM



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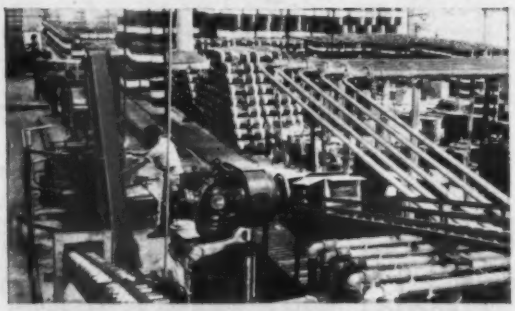

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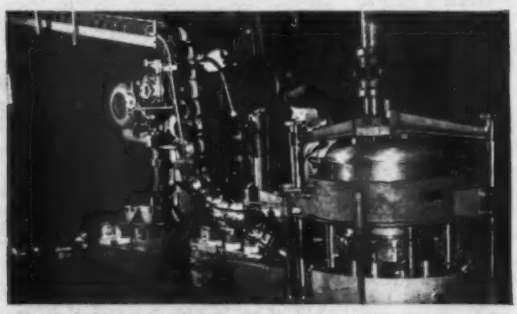

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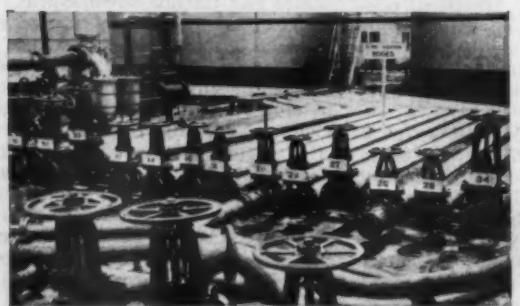

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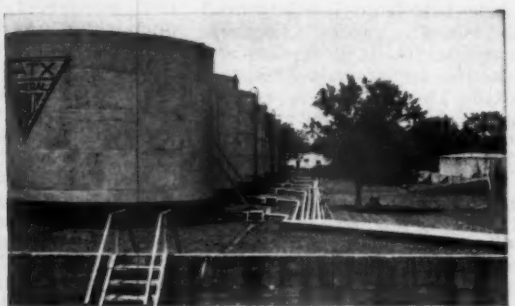

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PERSONALS

Technical Manager

L. O. Crockett has been with Gulf Oil since 1922

NOW in Pittsburgh in connection with his new duties as manager of the technical division of Gulf Oil Corp.'s manufacturing department is L. O. Crockett, formerly assistant general superintendent of Gulf's refineries in Port Arthur, Sweetwater, and Fort Worth, Tex.

In his new position Crockett is supervising direction of the company's several refinery laboratories and the refinery- technology division at Philadelphia. He also is serving as liaison of the manufacturing department in dealings with Gulf Research & Development Co.

A graduate of the University of Texas where he later served as an instructor for several years, Crockett joined the Gulf companies in 1922 as an assistant chemist in the experimental laboratory at Port Arthur. In 1928 he was named foreman of the lubricating-oil plant and in 1934 was appointed chief chemist for the three Gulf Texas refineries. In 1945 he was made assistant general superintendent in charge of refinery laboratories and technology.

W. E. Baldwin, assistant communications supervisor at St. Louis for Shell Pipe Line Corp., has been transferred to Houston as assistant to the superintendent of communications and transport facilities. Other changes include: **J. M. Kimbell,** station engineer at Ray, Tex., transferred to Boyd, Tex., in that capacity; **B. E. Miller,** transmission engineer at Houston, named Texas-Gulf area communications supervisor; **G. T. Kelly,** Texas-Gulf area communications supervisor, named communications engineer at Houston; and **H. G. Rodemar,** mechanical maintenance supervisor at Goodrich, Tex., named shop supervisor at Houston.

Noma C. Morgan, Service Pipe Line Co., has been appointed assistant chief station engineer at Freeman, Mo.. Other changes include: **Donald J. Heidemann,** Drumright, Okla., named division lineman at Manhattan, Kans.; **Joseph S. Gregg,** Manhattan, Kans., named district clerk at Joliet, Ill.; **David W. Heidler,** Topeka, transferred to Northport, Kans., as connection foreman; **T. W. Young,** chief station engineer at Elk Basin, Wyo., transferred to Casper, Wyo., in that capacity; **L. L. Harclerode,** chief station engineer at Mitchell, Mo., transferred to Elmont, Mo., in that capacity; **W. H. Higgins,** chief station engineer at Carrollton, Mo., moved to Mitchell, Mo., in the same capacity; and **Louis A. Springer,** chief station engineer at Lakenon, Mo., transferred to Carrollton, Mo.

E. J. Mills, project superintendent at Barnsdall Oil Co.'s Benton, La., recycling plant, has been transferred to Snyder, Tex.

Claude A. Teel, Skelly Oil Co., Midland, Tex., has been named district landman at Albuquerque, N. M. Other changes include: **Phil Hayes,** who has been on special assignment at Snyder, Tex., returned to Midland as landman; **J. W. Loofbourrow,** geological scout at Midland, transferred to Snyder to handle assignments in Scurry and adjacent counties; and **Ray W. Holbroock,** geological scout at Midland, transferred to Lovington, N. M.

John Ware, district manager for Barnsdall Oil Co. at Oklahoma City, has resigned and will set up a geological department for Harper-Turner Oil Co. He was with Deep Rock Oil Corp. in Tulsa before joining Barnsdall.

F. W. Krug has been appointed manager of operations for Pan American Pipe Line Co., Houston. Other changes include: **J. F. Chapman,** appointed general superintendent, and **W. H. Bruyere, Jr.,** appointed acting chief engineer, both headquartered in Houston; **Milton Crow** transferred from Kilgore to Snyder, Tex., where he will be superintendent of the company's newly formed West Texas division; **Harry G. Egle,** transferred from Alvin to Snyder, Tex., as division foreman, and **J. B. Johnson,** transferred from Kilgore to Snyder as district mechanical engineer.

Robert Hatch, manager of manufacturing and supply for Arabian American Oil Co., has assumed responsibility for the crude and refined-products division of the company. **T. J. Faughnan,** assistant to the president, has been placed in charge of Aramco's general-service division.

Ernest Cockrell, Jr., Houston independent oil man, has been elected president of the Houston Club.

J. M. Wren, Houston drilling contractor, has announced his candidacy in the Texas gubernatorial race.

K. B. Keary, geologist for Lion Oil Co., Jackson, has been transferred to the firm's Wichita office in that capacity.

Albert M. Schaefer, night foreman at the Whiting refinery of Standard Oil Co. (Ind.), who recently celebrated completion of 50 years of service with the company, will retire on company annuity June 26. All his service has been in the heavy-oils division at the Whiting refinery.

Jerry Knight, Amarillo, Tex., has transferred to Bartlesville, Okla., as division geologist for Phillips Petroleum Co. He has been succeeded as Amarillo district geologist by **Al Hornady.**

L. G. Smith, vice president in charge of the New York office of Creole Petroleum Corp., has been elected a vice president of the Venezuelan Chamber of Commerce in New York. Other new officers include: **Pedro Rincones,** of Creole's personnel department, secretary; and **Arthur W. Buttenheim,** chairman of Frederick Snare & Co., a vice president.

George H. Smith, Port Colborne, Ont., was recently elected president of the Natural Gas and Petroleum Association of Canada. Other officers include: **Charles N. Glenny,** Fort Erie, Ont., past president; **S. B. Severson,** Buffalo, and **J. B. McNary,** Hamilton, Ont., vice presidents; **L. B. Mehlenbacher,** Cayuga, N. Y., treasurer; **Joseph McKee,** Hamilton, Ont., secretary and assistant treasurer; and **Frank K. Howell,** Brantford, Ont.; **J. A. McNevin, K.C., T. Weir,** and **S. A. Morse,** Chatham, Ont.; and **J. M. Moffat,** Weston, Ont., named directors.

Jean Barrett, Pure Oil Co. production-engineering staff, has been transferred from Jal, N. M., to the Fort Worth division office, replacing **S. L. Britton,** who in turn is moving to the Dollarhide district. **Charles Hancock,** engineering department, has been

PERSONALS

transferred from the Dollarhide district to Pure's Tulsa office.

H. E. Treichler, Jr., has joined Houston Oil Co. of Texas as general superintendent of field operations. Treichler has been associated with The Texas Co. for the past 10 years, and is a graduate of the Colorado School of Mines. He is an active member of the American Institute of Mining and Metallurgical Engineers and the American Petroleum Institute.

Dr. H. H. Power, chairman, petroleum-engineering department, University of Texas, Austin, will be a consultant this summer with a Dallas petroleum engineering firm, working in California and in Mexico City.

D. H. Marston has been named superintendent of the Shreveport general office of United Gas Corp. A veteran of 20 years with the company, Marston was formerly assistant superintendent.

Dr. Rycroft G. Moss, reservoir and pool geologist for Phillips Petroleum Co. at Oklahoma City, has resigned to become a consulting geologist and engineer.

Sherman A. Berthiaume, division geologist for The Texas Co. at Houston, has been named senior geologist in the general manager's office.

Charles D. Towers has been appointed manager of the Mid-Continent district of the petroleum-chemicals division, E. I. du Pont de Nemours & Co., Inc., with headquarters in Tulsa.

M. E. Douglass has been elected secretary of Faultline Oil Co., succeeding **J. O. Hayes.**

Robert B. McCloy has been named division drilling superintendent for Stanolind Oil & Gas Co. at Oklahoma City.

George V. Holton, chairman of the board, Socony-Vacuum Oil Co., Inc., has been elected president of the Commerce and Industry Association of New York, Inc.

Cooper Hyde, formerly district geologist in the Permian basin of Texas for Devonian Oil Co., has been named district geologist of the newly established Midland offices for Houston Oil Co. Others attached to the office include **E. B. Dilley,** district landman; and **Henry Littlejohn,** assistant.

R. C. Jones, formerly roustabout foreman at McCamey, Tex., for Gulf Oil Corp., has been transferred to Crane, Tex., in the same capacity.

E. T. Anderson has resigned as production superintendent for **C. T. McLaughlin,** Snyder, Tex., independent operator, to become associated with Castleman & O'Neill, Midland, Tex.

C. H. Murphy, Jr., has been named president of the newly formed Murphy Corp., which assumed operations of all producing properties of C. H. Murphy & Co., El Dorado, Ark. Other officers of the corporation include: **Christoph Keller, Jr.,** vice president; **R. D. Curtis,** vice president of production; **M. C. Hoover,** vice president of land and geological departments; **W. E. Odom,** assistant treasurer; **R. L. Grady,** secretary; **Chadd L. Durrett** and **Melba T. Beasley,** assistant secretaries. Murphy is chairman of the executive committee with Keller and Hoover as members. **J. L. Pierce** is geologist and **C. O. Puckett** is landman of the firm's district office at Midland, Tex.; and **C. Philip Wagner** is geologist, and **C. C. Thomas** district landman at Denver.

D. W. Gough has been appointed a member of Kern Oil Co., Ltd.'s California management committee, Los Angeles. He has been serving on the committee as an executive assistance since his return from military duty in 1946. Other members of the British company's California management committee are **A. P. McEachern,** committee chairman, and also California counsel and assistant secretary of the firm; **F. M. Ziegler,** production manager and managing director of an associate company in the British West Indies, Kern Trinidad Oilfields, Ltd.; and **R. J. Stephens,** general superintendent.

Clyde Stone has been transferred as office manager of the newly established engineering department of Wilshire Oil Co. in Midland, Tex. He formerly was headquartered in Los Angeles.

D. M. McBride has been appointed manager of the crude-oil purchases and sales division of Phillips Petroleum Co., Bartlesville, Okla. He has served as assistant manager of the division for the past 3 years, and replaces **E. F. Guidinger,** who becomes consultant to **C. R. Musgrave,** vice president in charge of supply and transportation.

T. A. Manhart, Clark Millison, and **B. W. Beebe** have formed an exploration-consulting partnership with headquarters in Tulsa, and will specialize is all types of geological and geophysical services. Manhart organized Petroleum Consultants, Inc., in 1949, and formerly was with Shell Oil Co. Millison formerly was an independent consulting geologist, and Beebe formerly was with Anderson-Prichard Oil Corp. as exploration manager.

Harris Bateman, New York City, has been named chief engineer for Cities Service Oil Co. (Del.) and Cities Service Pipe Line Co., and also a director of Cities Service Oil Co. He formerly was coordinator of purchasing for Cities Service in New York. Bateman joined Cities Service at Bartlesville, Okla., in 1927 following graduation from Oklahoma A. & M. College, and was made purchasing agent in 1938, a position he held until 1942 when he was transferred to New York.

G. H. Embry, drilling foreman for Shell Oil Co.'s Eagle Lake district of Texas, has been moved to the Premont, Tex., district in that capacity, and **R. R. Barr,** drilling foreman at Premont, has been transferred to the Eagle Lake district. Other changes include: **A. F. Halcrow,** exploitation engineer for Shell Oil Co. of Canada, transferred to Houston; **B. L. Jones, Jr.,** landman at Corpus Christi, moved to Houston; **A. B. Neely,** mechanical engineer at Houston, transferred to the Eagle Lake district; **G. B. Oates,** mechanical engineer, Eagle Lake district, transferred to the Houston division; and **H. R. Thompson,** exploitation engineer at Houston, transferred to the East Texas production division.

Lubertus Bakker has been appointed industrial organic chemist, and **Charles F. Raley** has been named research chemist of Southwest Research Institute, San Antonio. Bakker formerly was research chemist for National Oil Products Co., and Raley formerly was junior research chemist for E. I. du Pont de Nemours & Co., Inc.

R. N. Armstrong, Tulsa, has been transferred to Ardmore, Okla., as scout and assistant geologist for Bell Oil & Gas Co.

Harry P. Dreher, Jr., engineer for Sohio Petroleum Co. at Madill, Okla., has been transferred to the West Edmond Hunton Lime Unit at Edmond, Okla., in the same capacity.

Alvin M. Jackson has established offices in Shreveport as an independent geologist.

J. M. Russell, Shell Oil Co., is en route to London, where he will serve as coordinator of company's operations in Trinidad, Venezuela, and Colombia.

James Tartt, geologist for Ohio Oil Co. at Houston, has been transferred in a similar capacity to the company's Roswell, N. M., office.

R. S. Gardner, Socony-Vacuum Oil Co., Inc., has returned to the United States after spending 3 years in Spain, and will soon leave for Guico, Venezuela, where he will be production foreman for the company.

F. G. Van Stratum, petroleum engineer for Continental Oil Co. at Lance Creek, Wyo., has been transferred to Casper, Wyo., in the same capacity.

Marvin Landry, New York City, has joined Socony-Vacuum Oil Co., and is now assigned to the company's Venezuelan operations, with headquarters in Barinas.

Leonard Walpole, assistant chief geologist with the Shell organization in Colombia, has been transferred in that capacity to Venezuela.

R. T. Helmer, Calgary, Alta., Canada, has joined Franco Oils, Ltd., as resident manager, with headquarters at Vermilion, Alta. He formerly was petroleum engineer for Hughes Tool Service, Ltd.

C. D. Hill, Carter Oil Co., has been elected president of the Billings, Mont., Petroleum Club. Other officers include: **Woodrow Geertz,** Farmers Union; **V. A. Gillis,** Northern Pacific Railroad; and **Grant Mollet,** the California Co., vice presidents; and **Alice Reid,** Oil Reporter, secretary-treasurer.

SHIFTS

Robert G. Partridge, engineer, C. F. Braun & Co., Temple City to Arcadia, Calif.; **J. A. Muir,** engineer, Western Petroleum Co., Oildale, Calif., to Coleman, Tex.; **Simon M. Landry,** Superior Oil Co., Nordheim to Bay City, Tex.; **Stanley Levanthal,** Geophysical Service, Inc., Tulia to Plainview, Tex.; **John L. Hancock,** engineer, J. S. Abercrombie Co., Bay City to Old Ocean, Tex.; **Frank C. Perkins,** engineer, Gulf Oil Corp., Goldsmith to Crane, Tex.; **Walter Aymonds,** superintendent, Nicklos Drilling Co., Houston to Silsbee, Tex.; **Pete Cawthon, Jr.,** engineer, City National Bank, Midland, Tex., to Houston; **Alvin Candela,** geologist, Superior Oil Co., San Antonio to Corpus Christi, Tex.; **F. J. Kirchman,** engineer, The Texas Co., Sundown to Snyder, Tex.

E. L. Love, Skelly Oil Co., Merkel to Trent, Tex.; **Weldon E. Williams,** engineer, Falcon-Seaboard Drilling Co., Portland, Tex., to Shawnee, Okla.; **C. M. Ambrose,** superintendent, Skelly Oil Co., Trent to Sweetwater, Tex.

George M. McCoy, Skelly Oil Co., Trent to Sweetwater, Tex.; **W. F. Hughes,** superintendent, Sun Oil Co., Premont to Arp, Tex.; **Gene Weger,** Sinclair Oil & Gas Co., Midland, Tex., to Corpus Christi; **J. M. Kilborn,** Gulf Research & Development Co., Ozona to Midland, Tex.; **George W. Atchley,** engineer, Republic Natural Gas Co., Taft, Tex., to Pauls Valley, Okla.; **J. W. Richardson,** Amerada Petroleum Corp., Winnsboro, Tex., to Turley, Okla.; **J. W. Williams,** superintendent, Falcon-Seaboard Drilling Co., Lafayette, La., to Corpus Christi; **T. F. Caldwell,** producer, Boca Raton, Fla., to Detroit, Mich.; **Frank A. Goerner,** superintendent, California Co., Brookhaven, Miss., to Waterproof, La.

Charles D. Geiger, engineer, Carter Oil Co., Jackson to Pickens, Miss.; **C. W. Ralston,** Skelly Oil Co., El Dorado to Madison, Kans.; **G. A. Schofield,** The Texas Co., Forsyth, Mont., to Perryton, Tex.; **W. F. Brown,** Continental Oil Co., Ponca City, Okla., to Bonham, Tex.; **C. Eugene Naugle,** engineer, Century Geophysical Corp., Ponca City, Okla., to Cuba, N. M.; **C. S. Gibson,** Skelly Oil Co., Velma, Okla., to Snyder, Tex.

George G. Iles, geologist, Union Sulphur Co., Inc., Sulphur to Lake Charles, La.; **J. A. Moore,** geologist, Union Sulphur Co., Inc., Sulphur to Lake Charles, La.; **Earl W. Harter,** engineer, the California Co., Waterproof to Venice, La.; **Justin F. Cooper,** engineer, The Texas Co., New York City to Austin, Tex.; **Frederick J. Bucher,** engineer, Federal Power Commission, Colorado Springs, Colo., to Omaha, Neb.; **Bruton E. Ashley,** geologist, Geological Survey, Denver, Colo., to Zomba Nyasaland, East Africa; **R. E. Beitman,** geologist, Ohio Oil Co., Sidney, Neb., to Casper, Wyo.; **Donald C. Albers,** engineer, Ohio Oil Co., Byron to Lovell, Wyo.; **Noah Bevins,** Ohio Oil Co., Lovell to Byron, Wyo.; **M. J. Boyce,** superintendent, Ohio Oil Co., Lovell to Casper, Wyo.

O. V. Henry, superintendent, Ohio Oil Co., Casper, Wyo., to Houston; **Howe M. Carey,** engineer, E. I. du Pont de Nemours & Co., Inc., Texas City, Tex., to Tulsa; **David A. Kinney,** superintendent, Furhmon Petroleum Co., Denver City to Andrews, Tex.; **T. L. Forehand,** engineer, Ohio Oil Co., Henderson, Tex., to Haynesville, La.; **J. A. Golasinki,** engineer, Shell Oil Co., Houston to Sheridan, Tex.; **Robert D. Maher,** engineer, Stanolind Oil & Gas Co., Odessa, Tex., to Tulsa; **E. B. Charlton,** superintendent, Ohio Oil Co., Haynesville to Sport, La.; **Harold C. Corbell,** engineer, Ohio Oil Co., Haynesville, La., to Henderson, Tex.; **W. R. Farley,** geologist, Union Sulphur Co., Inc., Sulphur to Lake Charles, La.

DEATHS

Walter Everett DeYarmett, 78, retired Tulsa independent oil operator, died June 6. He was credited with constructing one of the first casinghead gas plants in Oklahoma.

John Si Slike, 63, oil-well driller, died in El Dorado, Kans., recently. He moved to Oklahoma in 1905 from West Virginia, and was active in the Mid-Continent area.

Frank Tack, 66, retired oil-investment broker and independent operator, died in Tulsa June 6.

W. C. Samuels, 59, credit manager of The Texas Co., died June 1 at Houston.

Thomas A. Creekmore, oil man and former member of the National Bank of Tulsa board of directors, died in Tulsa June 9. He had been in the oil business since 1921, and was organizer of the Summitt Drilling Co., which he sold in 1940.

Charles H. Bixler, district gager at Denver for Shell Pipe Line Co., died recently.

J. B. Benson, 54, sales manager for Houston Oil Co. of Texas, died June 5 in Houston.

Oscar M. Campbell, 68, retired refinery superintendent for United Gas Corp., Agua Dulce, Tex., died June 4 at Corpus Christi.

John Franklin Shatford, 83, who with his brother established Eastern Oil Co. which was taken over later by Imperial Oil, Ltd., died in Halifax, N. S., June 8.

XUM

Canadian Bush Country . . . and its demands on geophysical equipment

by Charles J. Deegan

1—Road cut for running seismograph profile. This road runs through a burned area (forest fire).

2—Road cut for running seismograph profile through bush country in northern Alberta.

3—Road cut for running seismograph profile through extremely heavy bush.

AS the Canadian land play expanded rapidly northward, in the northwest portion of the Alberta basin, especially in the area north and east of the town of Peace River, the geophysical crews, particularly the seismograph parties, were sent into the country to work. They soon found out that the term "bush country" can be misleading to an American. Actually the bush country is in many places rather heavily timbered, interspersed with muskeg (swampy) areas. Figs. 1, 2, and 3 show some rather typical scenes, illustrating what such country really looks like to a seismograph crew. The trees, principally poplar and several varieties of evergreen, vary from a few inches in diameter in the burned-over areas to as much as 14 in. or more in other places.

Even where there is no muskeg, the drainage is poor, and when not frozen, the ground is usually soft and muddy. The mud is reported to be equal in all bad characteristics to the worst "gumbo" in the United States. To add to other difficulties, shallow, subsoil moisture is so abundant that the trees develop a shallow flat root system. Therefore when bulldozed to clear a path, instead of breaking off at or above the surface, quite often the whole root system will be pulled out of the ground, leaving a soft, muddy hole surface exposed.

In the winter period, which is long, there are the problems of extremely low temperatures, complicated by the short period of daylight in these northern latitudes. At temperatures of 20° to 40° below zero, the efficiency of both the human body and the machinery available for work drops very rapidly. In effect it requires a substantial effort, and an expensive one, to maintain either the body or the machinery in "idling capacity," and a correspondingly increased effort to accelerate either the body or the machinery to the point where useful work can be performed.

Considering the fact that it is substantially less than a decade from the time when geophysical activity in the Rocky Mountains, with far less severe climactic conditions, used to shut down for the winter, it is obvious that rapid progress has been made, when crews work all winter long in the Canadian bush.

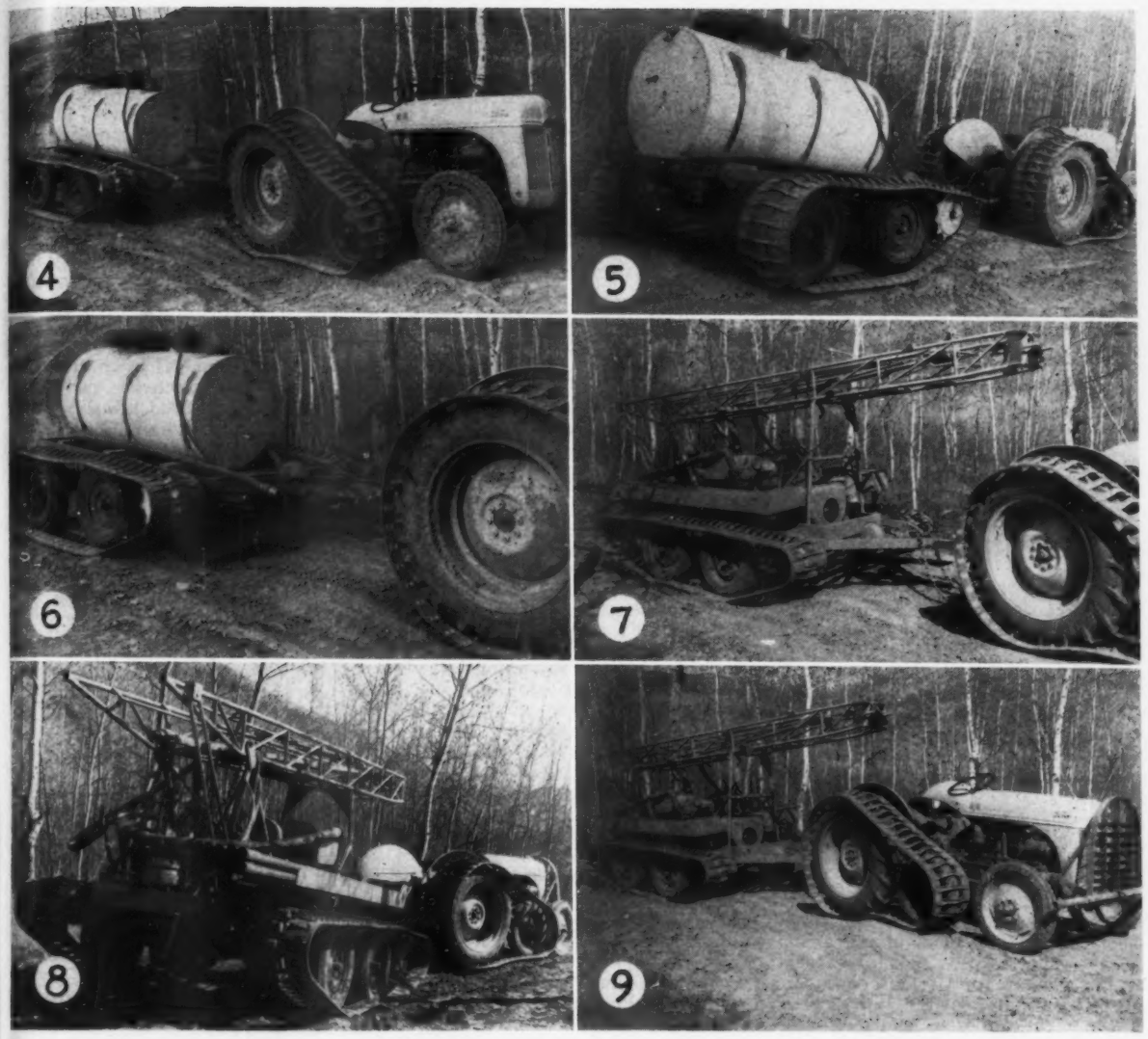
Now conditions demand further progress, namely that work be carried on in the bush country in the summer months, if physically and economically feasible. Prior to this year, no serious attempt has been made to carry on such operations, at least on any large scale, in the bush country after the spring thaw.

Summer work in the bush country is the pioneering problem now under attack. Like any other group of pioneers, the geophysicists have developed some general principles that apply to work in this country. In the application of specific solutions to specific problems within these general principles, there are some variations by individual crews; but on the whole it is surprising how closely they tend to reach the same conclusions and adopt the same general attack.

The first principle applies to genuine muskeg. That is, avoid it, unless absolutely and positively essential to get vital information. Muskeg varies widely in both size and character, and can range from depths of a few feet to more than 80 ft. Because of the moss on the top surface, and the fermentation in the rotting process of the material below the surface, it does not always freeze to a substantial depth, even in winter time, a maximum of 18 in. top surface frozen being quite common. In some areas the heat generated by rotting vegetation below the surface is rather high, and such areas are called "hot muskeg."

Seismic records across muskeg are generally rather poor, summer or winter. It is generally agreed that a man with a load on his back cannot possibly traverse real muskeg. Considering that probably the only way to get halfway good seismic records across the muskeg is the almost prohibitively expensive system of planting seismometers at the bottom, it is obvious that only under the most extremely urgent conditions will such expense be justifiable, unless the muskeg is quite shallow.

For the remainder of the area, the general principle applies that it is impractical to work in an area where the surface will not support a man on foot, carrying a reasonable weight. That means that any vehicles used must be so constructed that they do not place a higher weight per square inch on the surface than will a man.



4—"Bombardier" tractor-track wheel attachment. Behind is a 250-gal. water tank mounted on trailer, with same tractor-track wheel attachment. 5—Water in this portable water tank is prevented from freezing by a kerosine field flame thrower (weed burner type). The water is used for seismograph drill unit, in winter is obtained by dynamiting the ice cover of surface ponds, then pumping into tank. 6—Closeup of tank truck showing design of track-treads, frame, and connection assemblies. 7—Shot-hole drill ready to go into the bush country. 8—Rear view of specially mounted drill unit. 9—Combined bumper and grill guard is effective in pushing into brush.

Since some of the areas are so densely timbered that it is difficult, if not impossible, for a man carrying any load to traverse them on foot, it follows that in addition to the weight per square inch of surface, vehicles must be equipped to clear a path for themselves.

Finally, out of all these fundamental principles, it becomes apparent that the man who picks out the routes, lays out the trails to be followed, and supervises the bulldozer and brush-cutting operations, is the man who determines whether costs are held within reason or soar to prohibitive levels. The cost of trail cutting can vary from as low as $40 to as high as $300 per mile. The man out in front of the bulldozer will determine to a large extent whether or not summer bush operations are performed at a practical level.

Since the same general priciples apply to all geophysical parties, and as previously noted, they tend to come up with approximately the same type of solutions, further comments on equipment will be taken from the experience of National Geophysical Co., Inc. As of the present, they are considered reasonably typical.

National is now standardizing for its prime movers on a regular model Fordson tractor, plus a step-down transmission, plus a winch attachment, plus an extra-heavy front grille, plus "Bombardier Tractor Track Attachment." All trailer units, including the drill, also have the Bombardier TTA (as it is generally called) installed. See Figs. 4 to 9.

A Mayhew 200 drill, mounted on trailer, and powered with a four-cylinder air-cooled Wisconsin engine, sent up from the states, where it has been in use, performs satisfactorily. Since water is sometimes difficult to obtain in the bush, two trailer-mounted water tanks with one tractor unit are included. Water is a problem, especially in winter, when all units must be drained immediately after operations cease. A small recording cab, trailer mounted, and a flat-bed trailer for carrying powder, loading poles, etc., make up the explosive unit. Surveying is performed either from a tractor, in some cases a jeep, or other four-wheel-drive vehicle.

For brush-clearing operations, track-laying tractor, equipped with

10—Shot-hole drill and water truck "on location" in winter weather.

brush cutters for shearing off trees at ground level, will work in most cases. For larger trees, a chain saw should be carried. In many cases, conventional bulldozer procedure will be satisfactory. Fig. 10 shows the end product of all this work, the drill at work on a shot hole, with one water tank in service, the other pulled off somewhere by the tractor to fill up the water tank.

A trailer camp, such as shown in Fig. 11, is a necessity for the crew in working the bush country. On the other hand, such camps are difficult to move and take up considerable time in making ready to move and setting up to operate again at the new site, plus the actual travel time from one location to another.

In certain areas, at certain seasons of the year, National believes it is feasible to equip a party with a special kitchen trailer on tracks, to accompany men out on the line for several days without returning to base trailer camp. Such a special kitchen trailer must be equipped with a butane stove, gasoline-driven deep freeze and refrigeration units, and a water-purification plant. In addition, the men who will sleep out must be equipped with suitable sleeping bags, mosquito netting, and mosquito and fly-repellant liquids. The list of necessities illustrates the difficulties of gaining even a small addition in efficiency of operation in the bush country.

There are certain additional problems in winter operation that are not apparent in the accompanying pictures. For instance, the rear wheels of Ford tractors carry 400 lb. each of a calcium chloride solution to give weight and traction. Pure water would of course freeze, and the calcium chloride solution is a standard commodity for sale in this country.

The water tank for the drill must be heated in winter. This is done by flanging a piece of pipe from the back end of the tank horizontally through the center with two or more vertical risers through the top of the tank. A standard kerosine weed-burner flame thrower is then directed into the horizontal pipe to keep the water from freezing. The vertical risers create enough draft to maintain air flow to support combustion.

These are the objectives National seeks with its combination of units. First, the tractor-trailer combination nets a weight on a square inch of ground surface approximately one-half to one-fourth that of an average man. Second, relatively low first cost of standard tractor. Third, ready availability of repair parts. Fourth, relatively high speed compared to crawler-type tractor. Fifth, ability to remove tracks quickly when working in an area not requiring tracks.

In addition to the vital question of weight per square inch, in the bush country, the tractor-trailer combination offers certain other advantages. Here are some:

1. If the units become bogged down and stuck, the tractor can unhitch from its load, run off a suitable distance and then winch the trailer up to itself and proceed in the usual manner.

2. A breakdown in any one tractor will not stop all operations as any tractor can usually be used with any trailer.

3. In difficult going, two or more tractors can be used to pull any one trailer.

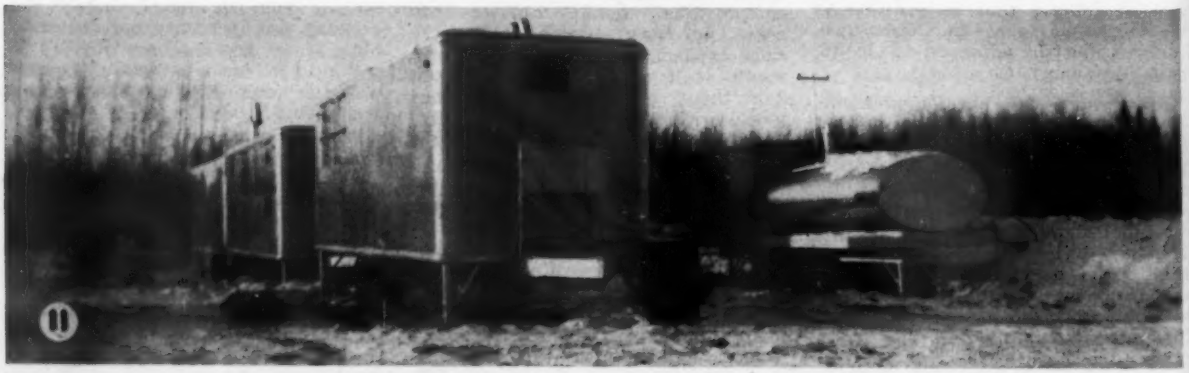
4. Two water trucks can be supplied by adding only the additional water trailer.

5. Only the tractors need be driven from field to camp, leaving the heavy load in the field.

Other companies are using slightly different combinations, but in general, the conditions to be overcome result in surprisingly similar solutions to similar problems.

The young geophysicists who are overcoming these difficulties are pioneers and like all pioneers suffer some hardships. Again, like all pioneers, they are too busy doing the job they have to do to earn a living, to have any appreciation of the fact that they are making history. There is no doubt that many of them get a satisfaction out of conquering natural obstacles of considerable magnitude in order to get the job done. But try and get them to admit they get any kick out of it. Nevertheless you note that they do stick it out, and 40° below zero, or knee-deep gumbo, they keep the profiles coming in.

11—Seismograph party living quarters of National Geophysical Co. of Canada, Ltd. This base camp is in bush country of northern Alberta about 80 miles north of Peace River.



Gas-Injection Project

Temblor Zone, Kettleman North Dome Field

by D. R. Knowlton* and R. W. Masters†

THE Kettleman Hills consists of three anticlines: North Dome, Middle Dome, and South Dome, which lie en echelon for about 30 miles along the west side of the southern San Joaquin Valley, trending southeastward from the Coalinga nose. This paper is concerned only with North Dome which lies in Kings and Fresno counties in Townships T21S, R17E; T22S, R17E; T22S, R18E, M.D.B.&M. (See Fig. 1).

As early as 1910 the Kettleman Hills were described as "possible productive territory" by Arnold and Anderson.[1] Several wells were drilled to test the shallower formations but it was not until November 1928 that the first commercial well, Milham Exploration Co. 1 Elliott, was completed in the Temblor zone on Section 2P. Initial production of about 4,100 bbl. per day of 59° A.P.I. oil and 77,000 M.c.f. per day of gas indicated a rich discovery of oil and gas.

Development of Kettleman Zones

After the initial discovery, drilling by the various operators became very active, and, a short time later, 32 drilling strings were in operation.

By agreement[2,3] on July 25, 1929, the Kettleman operators suspended all drilling wells after reaching the top of the Temblor until conclusions could be reached regarding several basic issues concerning development and production. This agreement continued until the end of March 1931 at which time the Kettleman North Dome Association was formed by unitizing government acreage in the field. Control and development of the field then was almost uniformly checkerboarded between the K.N.D.A., controlling all of the even-numbered sections of the field, and Standard Oil Co. of California, controlling all of the odd-numbered sections except for some acreage in Section 29J, called the "competitive area" and, in and near Section 35J, called the "Felix area."

Development proceeded rapidly in the low-gas-oil-ratio area of the north end offsetting the operators of the competitive area. Active development of the south end did not begin until 1937, 9 years after the discovery. By this time it was apparent that heavy withdrawals of oil and gas in the competitive area in the northern part of the field had caused a pronounced pressure sink, inducing migration of oil and gas from the south to the north end.

Structure and Stratigraphy

The field is approximately 14 miles long, 2 miles wide in the central part, and covers an area of approximately 16,000 acres. The anticlinal fold is asymmetrical with dips on the northeastern flank averaging 30°; whereas, the dips on the southwestern flank range from 45° to 60°.

Early development soon indicated that the Temblor interval could be divided into five main zones each having individual characteristics. In 1938, the Vaqueros zone, sometimes called Zone VI, was recognized. This zone had been included in some of the early Temblor completions, but was not isolated until 1941. In general, production from the Vaqueros zone has been segregated from the Temblor because of the pressure difference. Also in 1938 the McAdams sand of Eocene age was discovered which is essentially a high-pressure condensate reservoir.

No faults have been found in the Temblor zone, although there are numerous surface faults. Geologic and electric-log correlations through the Temblor formations show a high degree of structural uniformity, but there is considerable lenticularity of the individual sands.

Reservoir Characteristics

Early development of Temblor pool indicated the presence of an original gas cap in all five zones. Producing characteristics of individual wells clearly defined the gas-oil interface in these zones. Oil produced from the gas cap averaged 60° A.P.I. gravity, with a gas-oil ratio of 25,000 cu. ft. per barrel; whereas, oil produced downstructure averaged 35° A.P.I. gravity with a gas-oil ratio of less than 1,000 cu. ft. per barrel. It was later determined that the ratio of the total gas cap volume to the oil band volume was approximately 2 to 3.

In 1935, a joint research laboratory was established at Kettleman by Standard Oil Co. of California and the Kettleman North Dome Association. Temblor oil and gas samples were run to determine P.V.T. data and to obtain the type of information most useful for proper development and production practice. It was determined that the original formation volume factor, at 3,140 psia. at 7,000 ft. subsea, was 1.404, and that the original solution ratio was 724 cu. ft. per barrel.

During early field development and prior to 1939, no core-analysis data were obtained. Since 1939 an insufficient number of wells have been cored to accurately determine the average permeability of a reservoir of this size. Indicated average air permeability from available core data is 131 md. and is the result of weighing a wide range of values. The permeability variation of the Temblor zone was derived by treating the core data from all zones as a single group. The result of this calculation indicates a permeability variation factor of 0.8, as shown on Fig. 3. The concept of this factor as a measure of sand nonuniformity was developed by Jan Law.[4] Because of the more uniform nature of porosity, it is believed that the average of 17 per cent obtained by core analysis is probably representative of the reservoir. Based on oil-base cores and capillary equilibrium data, it is estimated that the average connate water saturation is 26 per cent (see Fig. 2).

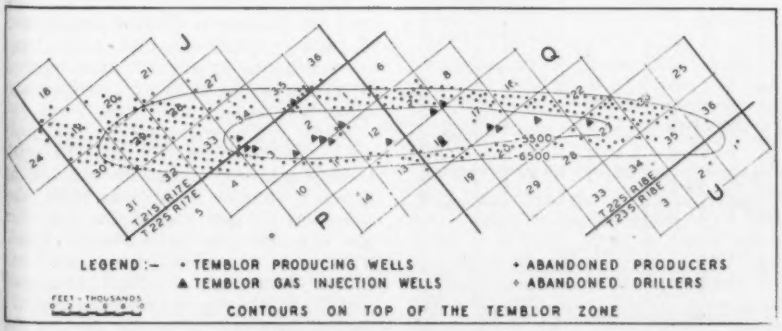


Fig. 1—Kettleman Hills North Dome Temblor zone.

*Reservoir engineer, Kettleman North Dome Association; †production engineer, Standard Oil Co. of California at Kettleman. Paper presented at Pacific Coast district meeting, A.P.I. Division of Production, Los Angeles.

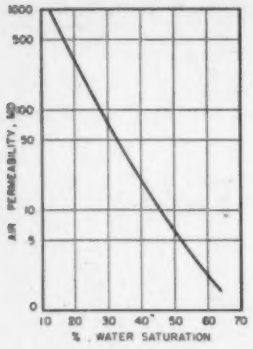


Fig. 2

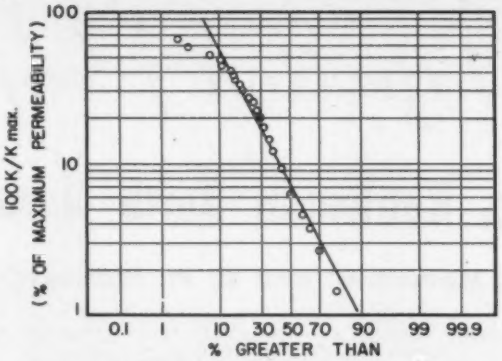


Fig. 3—Permeability distribution of Temblor zone.

Producing Characteristics

Early completions in the Temblor zone were prolific producers due to the high pressures and the large intervals open to production. Many wells were completed with all five zones open to production through a perforated liner of 1,600 ft. Wells completed in the gas cap were capable of 80,000 M.c.f. per day production or, if completed in the oil band, were able to produce 10,000 to 20,000 bbl. per day of oil. However, as edgewater began to encroach upon the reservoir in individual sands, the undesirability of multiple-zone completion soon became apparent.

After scabbing of perforations proved unsuccessful, the practice of cementing blank sections between zones came in vogue and as many as six blank sections were cemented in some wells. This method was used extensively in later south-end development where it has also proved very useful in gas-exclusion work. More recently, in new and redrilled wells, completions have been in specific fingers which are known to be clean.

Analyses of the different Kettleman zonal waters have been obtained since early development and extensive use has been made of this information in tracing encroaching zone waters. Water maps, indicating the structural position of edgewater in zones and subzones, are very helpful in planning remedial work and in anticipating changes in producing equipment. Gas-oil interface maps are kept as a means of following the advance of the gas cap.

Producing wells, completed by the different means of accomplishing various degrees of zonal segregation, offer a variety of problems and many different types of producing equipment are employed. In many instances, pressures are no longer sufficient for flowing production and some form of artificial lift is required in numerous wells. High-head formation waters in some wells make it difficult to draw down on the oil zones and high-output intermittent gas-lift equipment is required. Other wells require the largest pumps available to handle the large volume of water production. In some wells, poor gas separation interferes with pump operation. Corrosion has become a problem.

Productive capacities vary from 15 bbl. per day oil and 500 bbl. per day water in some wells to 800 bbl. per day clean oil in other wells. The following is the status of current Temblor zone wells:

Flowing wells	51
Gas-lift wells	94
Pumping (Kobe and rod)	77
Injection	17
Shut in, noncommercial, or suspended	96
Total	335

Average production per well is 115 bbl. per day oil, 92 bbl. per day water, and 693 M.c.f. per day gas.

The daily gas and oil production rates of the Temblor zone are shown by months on Fig. 4.

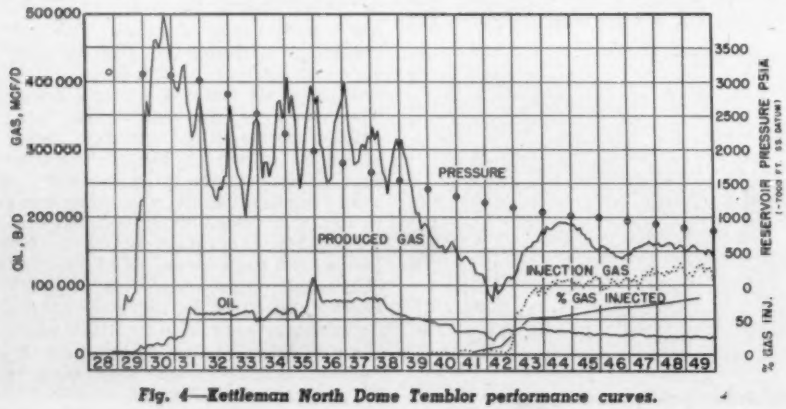


Fig. 4—Kettleman North Dome Temblor performance curves.

Initiation of Injection

As a means of increasing recovery, consideration was given to the return to the reservoir of a portion of the produced gas. The first injection experiments, which began in April 1938 when 16,436 M.c.f. of gas were injected, were of a gas-drive nature since the injection was done low on the structure in the oil band. Additional experiments were started in December of the same year; however, full-scale injection was not instigated until 1942. From this date a volume of gas equivalent to 66.8 per cent of the total gas produced since December 1942 has been returned to the formation.

During the middle of 1942 a significant reservoir trend developed which indicated that benefits could be derived from injection. Previously, in the competitive area of the north end, the pressure sink due to heavy withdrawals had been deepening. North-end oil production had been declining at a rapid rate due to the decreased rate of oil producibility at the lower pressures. However, during 1942, pressures in the north end showed a definite increase. This increase was not limited to the competitive area, where pressures were as low as 250 psi., but was general over the north end, indicating that some external force was at work and that the effect was not a local equalization of pressures.

The obvious conclusion was that, at the low oil rates, the north-end gas production had declined by the middle of 1942 at a rate lower than the gas-migration rate from the higher pressure south end and this influx of gas, combined with edgewater movement, was repressuring the north end. This fortuitous situation could not long remain a major reservoir factor. Large-scale injection in the north end began in December 1942 to supplement the natural reservoir forces and pressures rose gradually for several years; north-end oil production increased as the rate of oil producibility increased with higher pressures.

Large-scale injection in the south end which began in November 1942 did not result in any marked changes in producing characteristics, but a decrease in the rate of pressure decline was noted.

Early experience led to the natural conclusion that in a field with a large gas cap and with closure as great as that at Kettleman Hills, the injection of gas should be into the gas cap and not into the oil band. This was evidenced when gas injected into the oil band migrated rapidly upstructure. The upstructure migration was undesirable as it might force oil into the gas cap, a part of

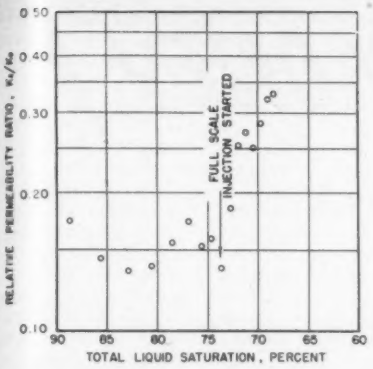


Fig. 5—Relative permeability from field performance.

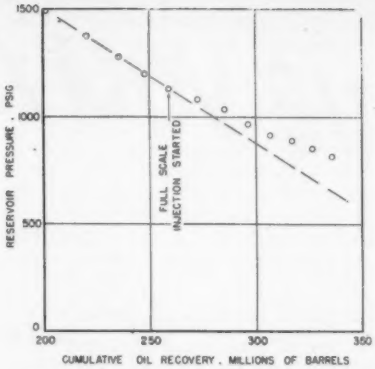


Fig. 6—Pressure-recovery relationship.

which would then be nonrecoverable. Therefore, injection of gas into the gas cap will be more beneficial. Water encroachment is a factor in this field but it is believed that the same net benefit from encroachment will be obtained whether injection is being resorted to or not.

Gas-Oil-Ratio Behavior

Cumulative gas production to January 1, 1950, has been 1,764,330,023 M.c.f., at a gas-oil ratio of 5,251 cu. ft. per barrel.

The relative permeability ratio (K_s/K_o) as shown on Fig. 5, is calculated from field data. This ratio is a measure of gas-oil-ratio behavior. Contrary to the usual trend, this ratio initially showed a decline even though the total liquid saturation of the oil band decreased, as it reflected the decline in gas-cap production and an increase in low-ratio-oil production. The subsequent increase and then decrease probably is due to a decline in oil production followed by a concerted effort by the operators to reduce gas production. The increase in the K_s/K_o ratio following injection is to be anticipated.

It is significant, however, that most of the increase is attributable to the south end where the narrow band of oil is located close to the high-pressure gas cap. In the north end, the gas-oil-ratio increase has been slight, due to the great extent of the oil band and the greater distance that injection gas must travel. Additional factors have been the development of low-ratio production in low-pressure sands and the continuing recompletion of high-gas-oil-ratio wells which has excluded a large volume of gas production.

Location of Injection

During the early development of the field, a number of wells had been drilled into the original gas cap, which provides a density and distribution suitable for a reasonable injection pattern. By confining the injection to the gas cap it is possible to sweep on a broad front toward the oil band. Although early pilot injection tests were conducted in the oil band, in Sections 19J and 20J, this injection as well as some other oil band injection has been discontinued.

Detailed maps have been prepared of each zone and subzone, delineating areas of reduced permeability and individual zone continuity. These data, combined with gas-oil interface, edgewater, and producing-well completion data are used to aid in the selection of injection locations which will insure, in each zone, the maximum sweep efficiency from the injected gas. Changes in the injection program are necessary from time to time to insure that the various zones receive their proportionate share of gas. However, due to multizone completions, it is not always possible to balance withdrawals from a specific zone with the desired volume of injection gas.

Rates of Injection

Since initiation of the injection project, a cumulative total of 283,583,982 M.c.f. of gas has been injected into the Temblor reservoir to January 1, 1950. During 1943, a volume equivalent to 53.5 per cent of the gas produced in that year was returned to the reservoir. This rate was gradually increased, reaching 80.1 per cent during 1949, and has averaged 66.8 per cent during the interval. The greater part of this volume has been supplied by the gas accompanying the condensate production of the McAdams zone, since tubing head pressures are sufficient for direct injection. During the 7½ years of major injection, an average pool injection rate of 108,500 M.c.f. per day has been maintained for an average per well injection rate of 7,750 M.c.f. per day.

Individual well injection rates have been as high as 18,000 M.c.f. per day and continuous rates of 16,000 M.c.f. per day have been common. Injection pressures, even at the high rates, have not been excessive, because of the amount of zone perforated, or as in the case of Zones II and III, the high relative permeability of the sands. These pressures have ranged from 800 to 1,800 psig., and are dependent upon the zone injected into and volumes being injected. However, most of the injection wells are not very sensitive to rates and only a few changes in injection characteristics have been noted, even after 7 years of continuous use. Some changes in injection pressures seem to be correlative with the water-vapor content of the gas, and it appears advantageous to remove all water before injecting.

Before direct injection of the McAdams gas, the condensate production is cooled and stripped of the major portion of its gasoline. It was fortunate that this source of high-pressure gas was available during the war years when it is improbable that compressors could have been procured for the injection of 60,000 to 110,000 M.c.f. per day of dry gas. To date, the major part of the injection project has been carried on by K.N.D.A. and Standard Oil Co. although other operators have joined the project for short periods of time.

Gas Bypassing or Selective Gas Movement

The usage of the term "bypassing" in connection with the study of the expansion of a gas cap is to be discouraged. Bypass means to pass around and beyond or to make a circuit. This does not describe the passage of gas through a sand of varying permeability. Gas will selectively move more rapidly in the most permeable finger but it is not "circuiting" the less permeable sands; it is merely moving more slowly in these sands. Thus, the movement is selective and the degree of selection depends upon the reservoir characteristics.

The important factors involved are: (1) mobility ratio, (2) pressure differential, (3) permeability variation, (4) liquid saturation, and (5) gravity segregation. Variations in the differential pressure across reservoir sands will cause a selective movement of gas but this can be minimized by injecting into sands of uniform pressure. The effect of permeability variation on the selective movement of fluids has been discussed in detail by Standing, Lindblad, and Parsons.* Variations in the liquid saturation will cause a selective movement but control of injection to provide a uniform expansion of the gas cap will tend to counteract this effect. Gravity migration of gas upstructure can be prevented by injecting in the gas cap and not in the oil band.

In the Temblor zone, the most convenient method of studying directional gas movement has been by the use of methane-ethane ratios of the produced gas, obtained from fractional analyses, in conjunction with well-production data. Practically all of the gas injected to date has been from the Eocene reservoir, and as this gas

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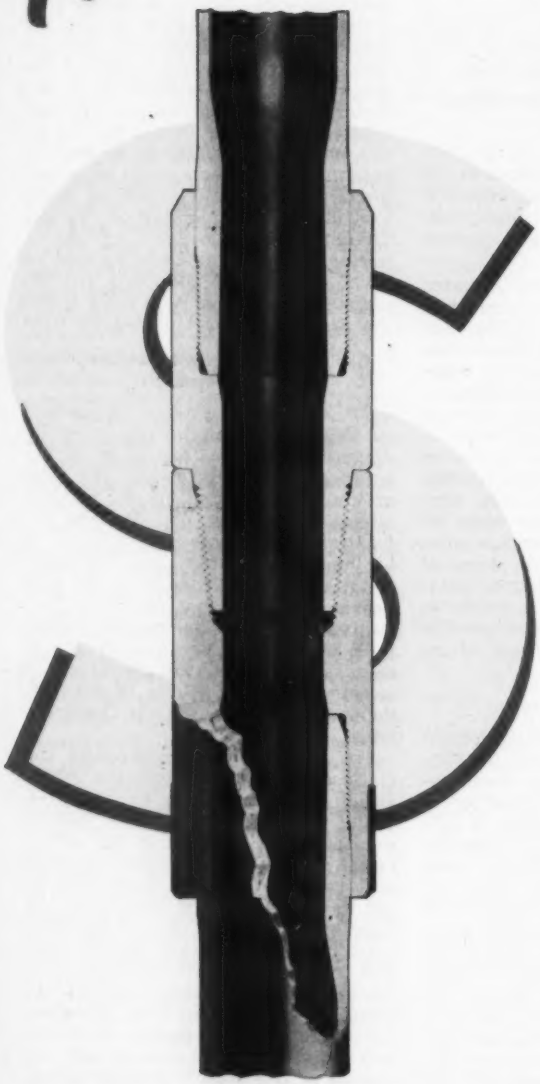

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has a methane-ethane ratio differing from that of the original Temblor gas it forms the basis for studying gas movement. Where there are sufficient data, this method is very successful, but due to the number of multiple-zone completions, it is not always possible to determine to which zone or subzone the produced injection gas may be attributed. Another method for studying gas migration is the observation of gas - oil - ratio trends. Though this method is subject to the same limitations as the use of methane-ethane ratios, data are available for all wells at all dates.

Initial injection to Zone II in the 19J and 20J areas, being of an experimental nature, was watched with interest, and a large number of gas samples were analyzed for methane-ethane ratio from 1941-1944. By this means it was possible to follow the fluid movement closely and to draw annual limits of the movement of the injected gas. The direction of movement has been determined largely by the differential pressure between the area of injection and Section 29J, and also to some extent by the tendency of the lighter injection gas to move upstructure.

Study of the continuity of sands has been helpful in tracing movements of injected gas.

In Zone II, in the south end, there has been a tendency for the gas to move largely toward the flanks of the reservoir, due to a band of thin and silty sands, found to be trending along the center of the field.

Zone IV has been interesting in that it appears to be the only one in which gas has migrated to the outer limit of the field. No edgewater movement has been observed in this zone which might account for this condition.

Zone V has lent itself to the study of directional fluid movement more readily than any other zone; due largely to the appreciable number of single zone completions in this interval. In the middle and northern parts of the field, annual limits of the movement of gas injected into Zones II and V have been drawn. Attempts to delineate limits of the injected gas for the other zones have been inconclusive. Gas migration has been most rapid in the first finger of Zone V. Determination of the migration pattern of the lower intervals of Zone V is difficult as these sands are usually produced along with the first finger. Gas injected in Zone V in other parts of the field appears to have migrated rather uniformly, at least in the first finger, which is continuous throughout the field.

It is difficult to determine, with any precision, the magnitude of fluid movements in the reservoir that can be attributed directly to the injection program. However, the methane-ethane ratio of produced gas has indicated an apparent rate of horizontal expansion, in the gas cap area, of 200 ft. per year in Zones II and V. During the brief interval that gas was injected into the oil band, the apparent expansion of the secondary gas cap occurred at a rate of about 100 ft. per year at low rates of injection.

The above data are used in controlling the injection program and injection volumes have been reduced in areas where they appear excessive. This has the advantage of varying the injection pattern which can considerably increase sweep efficiency over that for a fixed injection pattern. Periodic changes in the location of injection wells and the gas-injection rates result in a corresponding change in the direction of flow, and consequently bring about a resultant movement of oil toward producing wells that would not have existed under a fixed injection pattern. To facilitate changes in the injection pattern periodic pressure, temperature, and flow surveys are made.

Control of the Injection Program

To assure efficient conduct of the injection operations and to obtain the maximum benefits from the injection gas, it is necessary to compile and interpret basic reservoir data throughout the life of the project. For this reason, a detailed control program has been established for the gathering of data for the study of reservoir pressures, gas-oil interface and oil-water interface movements, and production and injection trends.

Mention has already been made of the effect that the method of field operation has had upon the shape of K_g/K_o curve based upon Temblor performance data. Thus, the K_g/K_o curve is an important indicator of reservoir behavior and its trend is followed closely.

A large volume of depth pressure data[6] has been obtained from Kettleman Hills wells, dating back to 1933. These data have been used for production problems and allocation purposes as well as for reservoir engineering. Periodically, these data have been analyzed and average reservoir pressures calculated at a 7,000-ft. below sea level datum.

In order to interpret pressure data more critically, a key well system was adopted in 1944, and pressures back to January 1, 1942, were revised on this basis to provide the most representative average reservoir pressures, both during and immediately prior to the large-scale injection of gas into the Temblor. Key wells have been established in which representative upper and/or lower zone pressures may be obtained. Injection wells are not used as key wells, nor are wells that have been invaded by high-head edgewater.

Pressures in the key wells are extrapolated to the 7,000-ft. subsea datum on an oil and/or gas gradient, depending on the relationship of the mid-point of the perforations and the datum plane to the gas-oil interfaces as established for the zones.

The trend of pressures obtained have been checked by annual material balance calculations, and it was found that the pressures as calculated followed closely the trend of the observed pressures. In this regard, the trend of reservoir pressure is more significant in reservoir calculations than is the exact value of pressure at any one time.

The results of injection have been reflected most clearly in the north end where it has been responsible for arresting the previous rate of very rapid production decline. The effect of this upon total pool production since injection began in 1942 can be seen quite clearly by referring to Fig. 4. Even though development has continued since the starting of injection and while this has had a sustaining effect upon the rate of oil production, it is to be noted that development was active also during the period immediately prior to the start of injection when the rate of oil production nevertheless was declining rapidly. This would indicate that the major cause of the sustained production rate since injection is due to the sustaining effect of injection upon north end pressures which has maintained the ability of that area to produce.

Another measure of the benefits of injection is to be found in Fig. 6 which shows the variation of reservoir pressure with cumulative recovery. This figure indicates that a new trend has been established and that continued injection should increase the ultimate oil recovery over that obtainable by depletion methods at the same abandonment pressure.

It should be noted that not all areas of the Temblor zone are receiving benefits from the injection program. In some parts of Zone V in the north end, certain wells have demonstrated a gas-oil ratio trend which is indicative of depletion type mechanism sand instead of the more rapidly increasing gas-oil ratio trend, characteristic of a reservoir in which gas is being injected. This may be due to the extreme width of the oil band in this zone in the north end which will take longer for injection gas to reach the structurally lower wells.

With the large number of zones and subzones open to production and the inherent over-all inefficiency due to sand nonuniformity, it is not reasonable to expect in a project of this size, that the benefits of injection can be balanced among all zones at any one time. However, continued review of the project, indicating necessary changes in the injection pattern, will give the best assurance that all zones may be swept with some degree of uniformity during life of the project.

References

1. Ralph Arnold and Robert Anderson, Geology and Oil Resources of the Coalinga District, California, U.S.G.S. Bulletin 398.
2. Joseph Jensen, Unit Operation in California, with Discussion of Kettleman North Dome Association, Transactions, A.I.M.E., 1931.
3. Roy E. Collom, Production and Supply of Natural Gas from Oil and Gas Fields in California, Petroleum World, Sept. 1947.
4. Jan Law, A Statistical Approach to the Interstitial Heterogeneity of Sand Reservoirs, Transactions, A.I.M.E., 1944.
5. M. B. Standing, E. N. Lindblad, and R. L. Parsons, Calculated Recoveries by Cycling from a Retrograde Reservoir of Variable Permeability, Transactions, A.I.M.E., 1948.
6. E. W. McAllister, Development and Application of Subsurface-Pressure Data in Kettleman Hills, Transactions, A.I.M.E., 1940.

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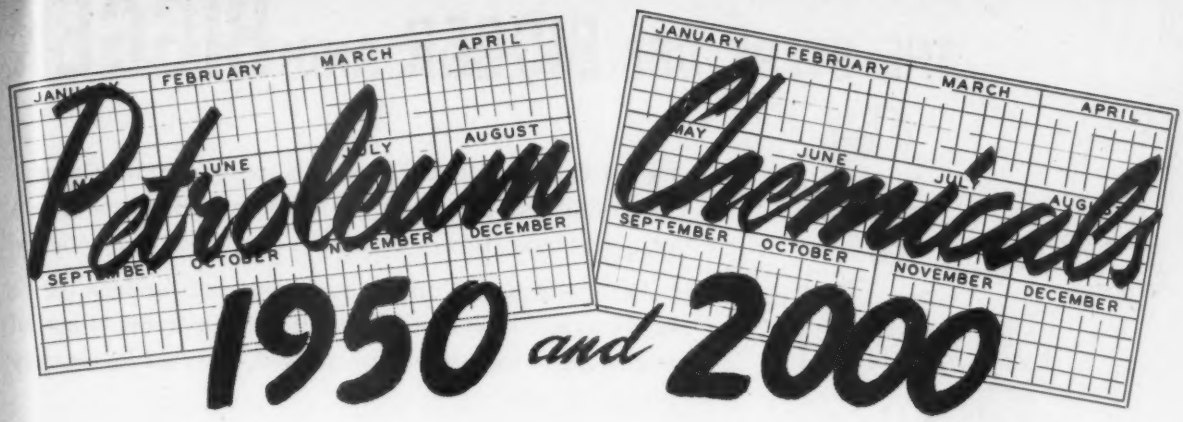


by Gustav Egloff*

FIFTY years ago, there was no petrochemical industry and very little chemical industry of any kind. In 1900, it was largely inorganic. Since that time, the chemical industry has been expanded at an ever-increasing rate, until we are now independent of foreign sources for our organic as well as inorganic chemicals.

The volume of our chemical industry has not only increased enormously but has undergone extensive diversification and is now in the multi-billion-dollar category. Plant investments doubled in the decade from 1939 to 1949, and in the 4 postwar years just passed, new plant capital expenditures amounted to $6,000,000,000. There have been 6,750 new chemicals made commercially available in the past 25 years, an average of 270 a year. Assuming only this same rate of production, the next 50 years will see the commercialization of 13,500 new chemicals.

In the past half century, a similar revolution has taken place in the petroleum refining industry. In 1900, the chief product from petroleum was kerosine, and every effort was made to force the highest possible yields of this product from the crudes available. Little thought was given to petroleum as a source of chemicals because almost nothing was known about the individual hydrocarbons present in petroleum. In 1896, ethyl alcohol and ether were made from the ethylene in cracked gas, but the process made little progress commercially.

The petrochemical industry really began in the early 1920's, with the production of about 250,000 lb. of isopropyl alcohol. In 1950, the estimated production of chemicals based on petroleum and natural gas is of the order of 12,000,000,000 lb. Based on the increase in petrochemicals from 1925 to 1950, the annual petrochemical production will be about 48,000,000,000 lb. in the year 2000.

*Universal Oil Products Co., Chicago. Presented at mid-century meeting, American Institute of Chemists, May 12, New York.

The present high production represents only 0.7 per cent by weight of our annual production of petroleum and natural gas. It can be assumed that production will be increased so that petrochemicals can be greatly expanded without using an appreciably larger percentage of available supplies. Petroleum consumption has increased about 50 per cent in the past 10 years to 6,000,000 bbl. per day. At this rate of growth, 16,000,000 bbl. a day would be refined in 2000 A.D. Natural-gas production has been doubled in the past decade to 6,000,000,000,000 cu. ft. a year. A similar increase over the next 50 years would provide 21,000,000,000,000 cu. ft. in 2000 A.D. Only 1 per cent of the total petroleum and natural-gas production could supply the predicted 48,000,000,000 lb. of petrochemicals 50 years hence.

Such growth also assumes a steady increase in proven reserves. Despite gloomy prophecies of early exhaustion, they have usually been maintained at about 15 times annual production. Petroleum reserves are now over 28,000,000,000 bbl. and are being enlarged. If the present ratio of reserves to production continues, proven reserves will reach 88,000,000,000 bbl. in the year 2000. The ratio of natural-gas reserves to production is about 30 to 1. Assuming that they will also continue to increase, reserves will total 630,000,000,000,000 cu. ft. in 50 years.

Despite almost unlimited supplies of raw materials, the rapid development of the petrochemical industry must be attributed to research. Petroleum was one of the first industries in the United States to appreciate the real values obtained from research. In 1900, there were only about 30 chemists working in petroleum refining in all capacities, of whom only three were research men. By 1918, partly because of developments in cracking processes, the number of research workers had risen to somewhat over 200. From 1918 on, the curve of increase has become much steeper until at the present time there are probably from 10,000 to 15,000 research scientists in petroleum refining. Research expenditures in the petroleum industry have risen correspondingly, and are now of the order of $110,000,000 a year which is about 25 per cent of all money spent by industry for research. As an indication of the new appreciation of the value of research, the ratio of research expenditures to sales has doubled since 1939.

The petrochemical industry is principally interested in large tonnage products, but is also producing small quantity items. The major products include alcohols, glycols, glycerin, rubber and plastics chemicals, ammonia and other nitrogen fertilizers, explosives, detergents, and insecticides. A review of the history of some typical products will indicate growth trends.

Alcohols

The growth of alcohol manufacture from petroleum is perhaps as typical as that of any group. The earliest commercial achievement in this field was the manufacture of isopropyl alcohol from the propylene in cracked gases. In 1920, a pilot plant was operated at Bayway, N. J., to produce this alcohol as a source of acetone. Production of the alcohol in commercial amounts took place shortly after. The initial product was impure and used only as a denaturant for ethyl alcohol. At the present time, however, isopropyl alcohol is competitive with ethyl alcohol. It is now in the same price range, and is displacing ethyl alcohol in the field of lacquer solvents. In 1948, the last year for which figures are available, production was 127,200,000 gal.

The manufacture of ethyl alcohol from the ethylene in cracked gases began with a small production about 1930. In 1931, about 8 per cent of a total production of 87,000,000 gal. from all processes was synthetic. The production of synthetic has increased to 90,000,000 gal. in 1949, representing

XUM

THE STEPS GET BIGGER AND BIGGER

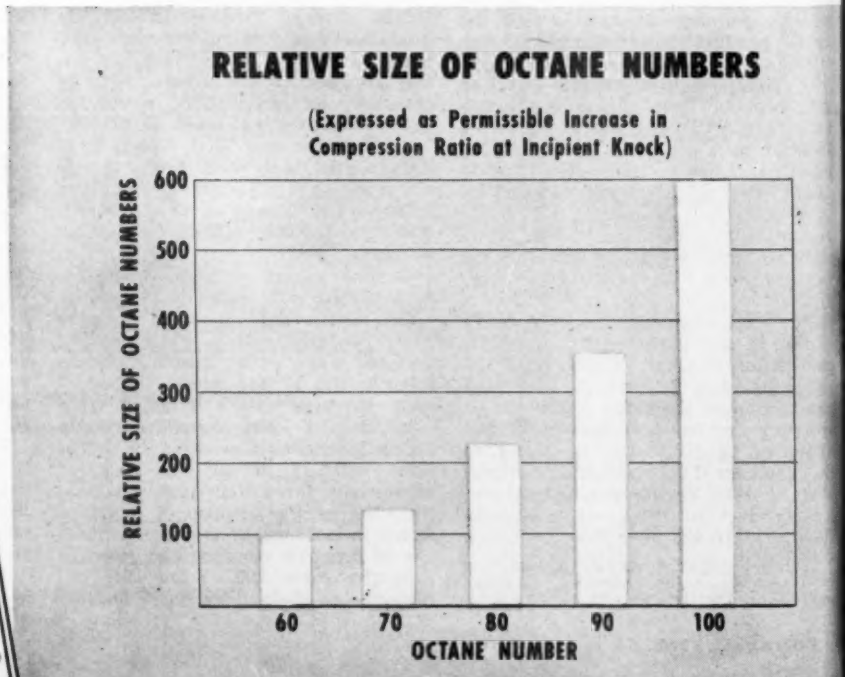
THE Octane Number Scale is a useful tool for the control of gasoline quality. However, it does not give a complete indication of what fuels can deliver in an engine.

On the Octane Number Scale, one unit appears to be equal in size to every other unit. But in terms of actual engine performance, octane units at different levels vary greatly in size.

For example, expressed as *permissible increase in compression ratio* (bar chart below), one octane unit at the 90 level is 3.5 times as large as at the 60 level. At the 100 octane level, a unit is 6 times as large as at the 60 level. In other words, the steps going up the octane ladder get larger and larger.

Complete evaluation of the quality of gasoline requires measurement not only in terms of octane numbers but also in terms of scales based on those factors of engine performance dependent on antiknock quality. Three such scales are permissible compression ratio, thermal efficiency and power output. The three charts at right show the relationships between octane numbers at given levels and these engine-performance factors, as obtained on representative engines.

CHART 1. *This chart shows that the units going up the octane scale becom larger and larger in terms of permissible increase in compression rati*



GOING UP THE OCTANE LADDER

Charts 2 and 3 at right show data obtained on engines as the compression ratio is varied.

Chart 2 shows that the *maximum permissible compression ratio* of an engine increases more rapidly than the octane number of the fuel. Chart 1 (lower left) also expresses this relationship.

Chart 3 shows the variation of engine *thermal efficiency* with fuel octane number as compression ratio is increased. Like permissible compression ratio, engine thermal efficiency increases more rapidly than fuel octane number.

Chart 4 shows the maximum power obtainable at fixed compression ratio from an engine in which increased antiknock quality is used to improve volumetric efficiency, as in supercharging. The power obtainable from a supercharged engine rises faster than the octane number of the fuel. (A similar relationship forms the basis of the Army-Navy Performance Number Scale, on which 100 performance number is equal to 100 octane number.)

All three charts show that in terms of potential engine performance, octane numbers get bigger and more valuable going up the scale.

The improvement of fuels to meet the steady average increase in compression ratio, designed each year into automobiles, requires a full understanding of all the potentialities of fuel quality. When reviewing the economics of gasoline production, refiners might profitably think not solely in terms of octane numbers but in terms of scales of antiknock quality based on the three factors of engine performance—maximum permissible compression ratio, thermal efficiency, and maximum power obtainable. Future messages will use these scales in discussing benefits from the addition of tetraethyllead to gasolines.

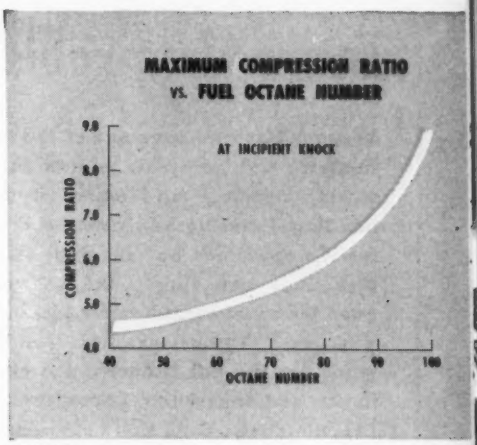


CHART 2

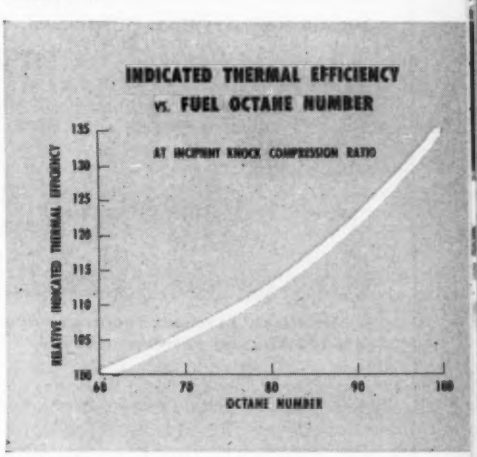


CHART 3

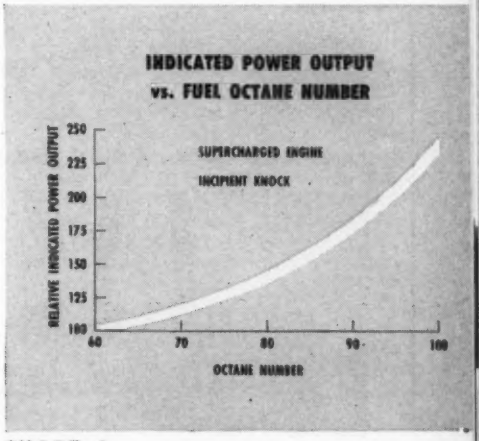


CHART 4

Since 1923—*continuous research to provide better antiknock service*

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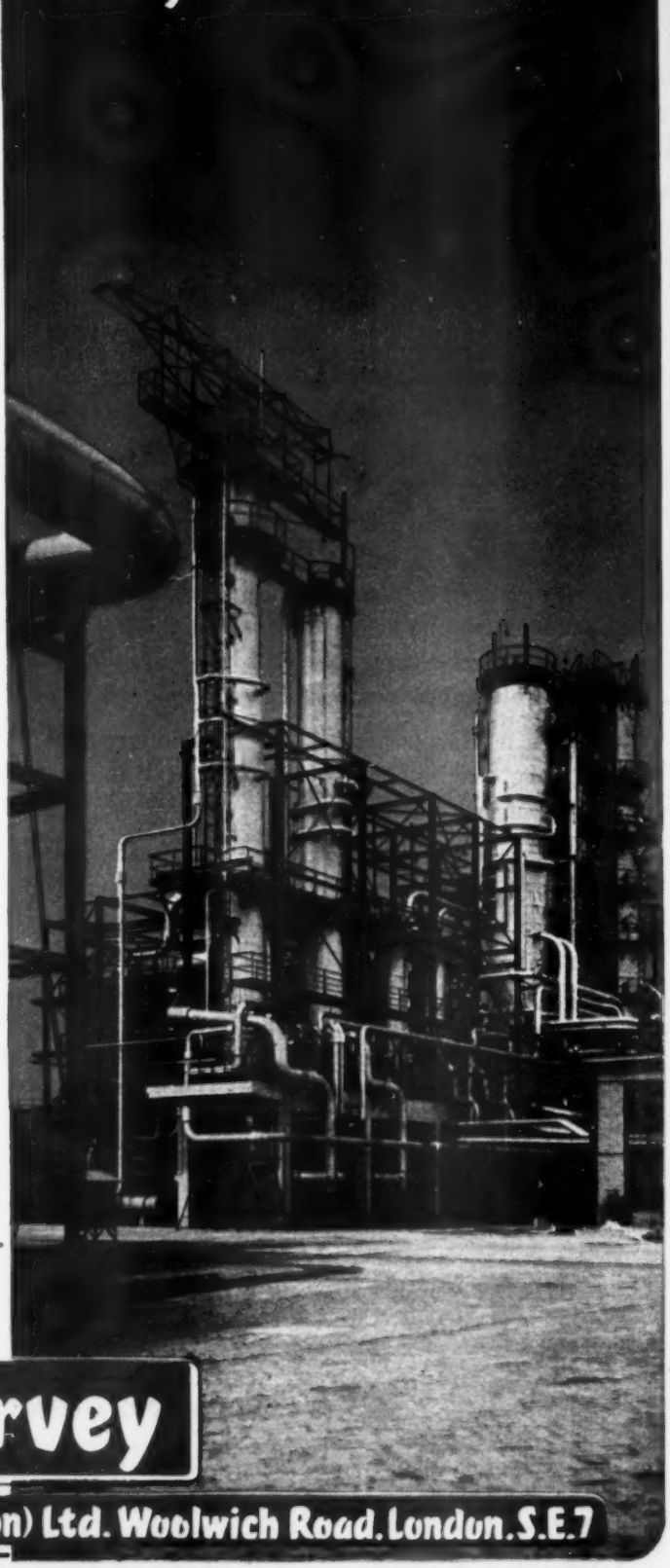
A completely fabricated column is lowered into the Thames near the works—

Towed across the North Sea to Holland—

and lifted from the water at Pernis—quickly to take its part in this new Oil Refinery.



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nearly 50 per cent of a total gross production of 188,000,000 gal. The use of petroleum as a source of alcohol conserves enormous quantities of grains for human consumption as evidenced by the fact that the 90,000,000 gal. of synthetic alcohol released 1,300 sq. miles of corn land for food production. By the year 2000, it is likely that practically all of our alcohol will be synthetic, since more grains and other foods will be needed to feed the increased population.

Synthetic methanol came into the picture about 1925, when a foreign shipment arrived at New York. A year later a synthetic plant began operations in the United States and present capacity is about 150,000,000 gal., two-thirds of which is installed to produce methanol from natural gas.

The manufacture of ethylene glycol from ethylene began in 1925 with the production of about 50,000 lb. With increasing use of this dialcohol as an antifreeze, production reached 366,000,000 lb. in 1948, and its use is certain to increase with the ever-rising number of automotive vehicles. Ethylene glycol is also used as an intermediate in the formation of ester solvents, plastics, and polymer products. Triethylene glycol has been found to be an effective germicidal aerosol. This method of air purification has now reached commercial status for homes, office buildings, and factories.

A recent development in synthetic alcohol manufacture is the use of the Oxo process for making higher-molecular-weight compounds. In this process, mixtures of carbon monoxide and hydrogen are contacted with liquid olefins from cracked gasoline. Under high temperatures and pressures in the presence of catalyst, aldehydes are formed and hydrogenated to the corresponding alcohols. Octyl alcohol is in commercial production and is used in the manufacture of plasticizers.

An outstanding achievement of the petroleum industry is the manufacture of glycerin from the propylene in cracked gases. After a long period of research, during which the substitutive chlorination of olefins at high temperatures was discovered, glycerin was produced from propylene by successive steps of chlorination, hypochlorination, and alkaline hydrolysis. A number of important byproducts have resulted from the primary process. These include epichlorhydrin, allyl chloride, allyl alcohol, allyl ether, allyl esters, acrolein, and the soil fumigant DD which is a mixture of chloropropylenes and chloropropanes.

The additional supply of 30 to 35 million pounds a year of glycerin from propylene is about 15 per cent of the annual consumption. It has helped to stabilize the market and has prevented diversion of corresponding amounts of natural fats away from human consumption. Assuming a continual increase in population, and greater demands for food, synthetic glycerin will dominate the market in the year 2000. In the matter of food, synthetic glycerin has further potential significance. It makes possible the synthesis of additional fats by reaction with high-molecular-weight fatty acids from petroleum wax. This process has actually been used in Europe and holds high promise in meeting food crises as they occur.

Agricultural Chemicals

Modern agriculture is a highly scientific industry. Petroleum chemicals have supplied this industry not only with an augmented supply of such products as fertilizers but also with a battery of entirely new products. These new items have increased the quantity and quality of food products and cut down man-hours of labor as well. The production of synthetic ammonia as a base for nitrogeneous fertilizers has been expanding rapidly in the last two decades. Prior to 1932, none of the essential hydrogen for ammonia synthesis came from natural gas. In that year, there was a total production of 300,000 tons of synthetic ammonia and of the hydrogen needed for the year's production, natural gas supplied only 3.0 per cent.

Our 1950 annual capacity for synthetic ammonia is 1,800,000 tons and 43 per cent of the essential hydrogen comes from natural gas. In the manufacture of ammonia from natural gas, nitrogen is also obtained by combustion of the gas in limited amounts of air, which consumes the oxygen and leaves a residue of nitrogen. Subsequent manufacture of ammonium nitrate and ammonium sulfate supplies nitrogeneous fertilizers for intensive agriculture.

For many years, the petroleum industry has supplied enormous quantities of oil for insecticides. The radical new developments in chemical insecticides such as DDT have opened large markets which can be satisfied largely by petrochemicals. The significance of the insecticide market to the petrochemical industry is becoming even greater as practically all increases in demands for aromatics must be supplied by petroleum. DDT production in 1949 reached 30,000,000 lb. The insecticide gammexane first appeared in 1947, when 8,000,000 lb. were produced. In 1950, it is being produced at the rate of 36,000,000 lb. a year.

These insecticides are not only toxic to disease carrying flies and mosquitoes, but also to parasites on both humans and animals. These lethal weapons in the battle for more food have not only enabled the rehabilitation of millions of acres of land but have increased meat production from cattle and hogs by eliminating irritating insects. Similarly dairy cows are more contented and give higher milk production when they are not bothered by flies and other insects. The savings in crops and meat products by these oil-based insecticides are already immense and will increase in the future.

New insecticides for special purposes are constantly being discovered. Some of the recently developed ones are dieldrin which is claimed to be 20 times more lethal against flies than DDT, and a nitro-paraffin mixture called dilane to control the bean beetle. Toxaphene is effective against grasshoppers and boll weevils, and the compound chlordane is especially effective in mosquito control. It has been estimated that use of toxaphene and chlordane in controlling grasshoppers in Montana and Wyoming saved 2,695,000 acres of range land and made possible the production of 16,000,000 extra pounds of beef in 1 year.

The soil fumigant DD, a byproduct of synthetic glycerin manufacture, destroys wire worms and nematodes and has resulted in the increase of crop yields as much as 200 per cent. The potential market for DD is large. It has been estimated that 2,000,000 acres of land in the South could be restored to productivity by treatment with DD.

Weeds account for an annual loss of $5,000,000,000 in crops, and therefore weed control has become a major project in our economy. Petroleum supplies many of the basic compounds needed in the manufacture of weed killers.

A petroleum company has also developed a weed killer similar to 2,4-D. Another important material is TCA (trichloroacetic acid) which is toxic to quack, Bermuda, Johnson, and crab grass, and has no effect on broad-leaf plants. IPC (isopropyl-N-phenyl carbamate) has similar activity. Another compound related to 2,4-D is known as 2,4,5-T (trichlorophenoxyacetic acid). It is particularly good in removing mesquite and other woody plants from grazing land. Weed killers are also deposited in thin films on seeded ground to kill the weeds as they emerge.

It is to be anticipated that new products from petroleum will be developed at a tremendously increasing rate for improving agricultural operations. A number of oil companies are maintaining their own experimental farms for direct testing of agricultural chemicals.

Rubber

Synthetic rubber has become a large commercial industry in less than a decade. Synthetic rubbers have been enormously improved since the war, and their properties can be precisely controlled inasmuch as high-purity compounds such as styrene and butadiene are used as starting materials and conditions can be more carefully regulated. In contrast, the properties of natural rubber vary widely from one batch to another.

XUM

The principal type of rubber is a copolymer of styrene and butadiene, for tires. New developments in "cold" rubbers have produced better-quality synthetic tires and further improvements are certain. Another rubber which has developed under stress of war needs was butyl rubber, a copolymer of isobutylene and isoprene. This rubber is better for inner tubes than natural rubber because of its greater air retention and resistance to aging and tearing.

Another type is Perbunan, a polymer of butadiene and acrylonitrile. The value of Perbunan lies in its ability to retain elastic properties at low temperatures encountered in the arctic. It solved difficulties which arose from the fact that rubber-hose connections in airplanes became brittle and disintegrated at subzero temperatures.

A maximum capacity of a million tons a year of synthetic rubber was reached during the war. At the present time about 400,000 tons of synthetic rubbers are being produced and about 600,000 tons of natural rubber are being imported and 225,000 tons of rubber reclaimed.

Expansion of the synthetic-rubber industry can be safely predicted regardless of the availability of the natural product. Research is constantly finding ways to improve present products and is discovering new rubbers which are specifically adapted to meet certain needs. Demand for synthetic rubbers in 2000 A.D. will probably be over 2,000,000 tons, all of which can be derived from petroleum and natural gas.

Plastics

Plastics and resins comprise one of the largest markets for chemicals from petroleum and natural gas. One of the most important petrochemicals is ethylene which is itself polymerized and also serves as one of the basic materials in the synthesis of vinyl chloride, acrylonitrile, styrene, and other products. Production of polyethylene, a relatively new product, reached 30,000,000 lb. in 1949 and is still increasing. A major use of polyethylene is in cable covering and other insulation. The use of polystyrene plastics is also expanding. In 1946, 60,000,000 lb. of polystyrene products were manufactured and this had increased to 200,000,000 lb. in 1949.

One of the greatest contributions of petroleum research to the plastics industry is the manufacture of phthalic anhydride by the catalyzed oxidation of orthoxylene from petroleum. This product is a basic material for plasticizers and alkyd resins. The present annual production of 8,000,000 lb. of this product augments the inadequate supply from naphthalene.

A large potential market lies in plastics based on aromatics such as the phenol-formaldehyde type. Phenol will probably remain in short supply until increasing quantities of benzene are available from petroleum.

Plastics are steadily displacing older and more expensive natural materials. For example, they are replacing nonferrous metals for many uses, and continuing research will bring about the development of products with a great variety of properties for specific purposes. The production of all types of plastics in the United States is estimated to be 1,800,000,000 lb. for 1950, representing the astounding increase of 600 per cent in the last 10 years. On this basis one can well expect a 25-fold increase in the next 50 years. Phenomenal as the variety of plastics has been, one can be assured that a much greater variety of products is yet to be developed.

Textiles

The petroleum industry supplies many of the chemicals for synthetic textile fibers. The raw materials for nylon, originally based on "coal, air, and water," at present come from a number of sources including petroleum. Nylon salt is now made from cyclohexane from petroleum. It is also planned to use butadiene as a basic material for nylon salt production. Petroleum is also beginning to supply part of the benzene previously obtained from coal. In 1949, 75,000,000 lb. of nylon were used. The popularity of nylon for garments and many other purposes assures a continued increase in production.

Petroleum also furnishes ethylene which is used in making Vinyon, a vinyl polymer, and Saran, a vinylidene polymer. Manufacture of the cellulose-based rayons are to some extent dependent on petrochemicals for such substance as ethylene used in making ethyl cellulose and acetic acid used in cellulose acetate.

A new synthetic fiber called Orlon is going into production. Fabrics made from Orlon are nonshrinking and washable. They will be used in wearing apparel, curtains, lamp shades, automobile tops, awnings, filter cloths, tarpaulins, and luggage. It is expected to be highly competitive with cotton, silk, and wool. Orlon is a polymer of acrylonitrile which is now produced at a rate of 28,000,000 lb. annually from ethylene oxide and hydrogen cyanide. Other processes, in the development stage, are promising. The demand for acrylonitrile, which already has extensive use in the plastics industry, 10 years from now is expected to be about 300,000,000 lb. a year.

In the textile field, petroleum also supplies copper naphthenates for impregnating textiles to render them resistant to mold and mildew. The chemical glyoxal is used to impregnate rayon fabrics to prevent shrinkage when wet. This compound was first produced in 1945, but by 1947 it was being shipped in tank-car lots to shirt makers.

It is safe to predict that synthetic fibers will steadily replace cotton and wool in the next 50 years so that a greater proportion of our clothing will be based on synthetics.

Detergents

Another large market for petroleum chemicals is the rapidly growing detergent industry. The most important type of petroleum derived detergents is the alkylaryl sulfonates which have alkyl chains of 12 to 16 carbon atoms. Others from petroleum are the alkyl sulfates and sulfonates. The nonionic detergents which are relatively new but of increasing importance are made by condensation of ethylene oxide with such substances as alkyl phenols. The market is also being expanded by the introduction of additives which permit use of the petroleum detergents for a greater variety of purposes. These additives include polyphosphates which render detergents useful for heavy-duty laundry and carboxymethyl cellulose which prevents redeposition of solid particles on the objects being cleansed.

Synthetic detergents were first introduced to the market in 1930. They included sulfated alcohols from coconut oil, and petroleum sulfonates. The production of detergents increased to 400,000,000 lb. in 1945. In hard-water areas, they have now taken over half of the soap market. The total production of synthetic detergents was 1,000,000,000 lb. in 1949. Of the surface-active agents in these products, petroleum supplied 60 per cent. It is predicted that the amount of synthetic detergents will reach 5 billion pounds or more by the year 2000.

Miscellaneous Products

Many petrochemical products are in the so-called specialties class. Among these are ethylene diamine which is an effective fungicide and a wetting agent which permits asphalt to adhere to wet rock aggregates.

Some petroleums furnish naphthenic acids for soap manufacture. The total annual production of naphthenic acids is now of the order of 25,000,000 lb. annually. The soap products are marketed in large volumes for specific cleaning operations.

Carbon disulfide is now made by reacting sulfur with natural gas or methane. This versatile product finds use in rayon and cellophane manufacture, in the vulcanization of rubber, and making insecticides and fumigants. Thiophene is being manufactured by the catalyzed interaction of hydrocarbons and sulfur dioxide. Highest yields are obtained with butanes and butylenes. The product is used in making pharmaceuticals, particularly antihistamine products.

Aromatics

Present trends indicate that the greatest expansion of petrochemical industry will be in aromatics. The supply of benzene in particular has reached a critical stage because of

its increasing use in chemical manufacture. Benzene, toluene, xylenes, and other aromatics have been produced as byproducts of coal carbonization, and their production depends on the amount of coke required by the steel industry. The present developments in the use of oxygen instead of air in blast furnaces will eventually result in the need for less coke which will in turn reduce the production of aromatics from coal carbonization. It is, therefore, certain that more and more dependence will be placed on petroleum for supplies of aromatics.

Commercial derivatives of benzene are many and varied. The uses of benzene derivatives are rapidly mounting and benzene production is at present unable to meet demands in full. Benzene production in 1948 was 184,000,000 gal. This is the highest peacetime production ever recorded in this country, the average prewar output between 1937 and 1943 being about 145,000,000 gal. Currently, about 50,000,000 gal. are going into the manufacture of styrene, 35,000,000 for making phenol, 20,000,000 for nylon, and 10,000,000 for aniline.

Supplies of benzene from coal are inadequate to meet requirements. At the present time, one plant in Texas is producing benzene from low-boiling naphtha by dehydrogenating a fraction containing cyclohexane and methylcyclopentane which isomerizes. The operation is being conducted in a hydroforming plant used during the war for the production of toluene. This plant is producing at the rate of 3 to 5 million gallons of benzene a year and another large company is projecting a plant for benzene production. Benzene is also produced by the high-temperature cracking of gas-oil fractions from petroleum.

The Platforming process for increasing the antiknock rating of straightrun and natural-gas gasolines yields products containing from 30 to 55 per cent aromatic hydrocarbons, which can be separated from the other hydrocarbons. The expansion of installations of this process will assure further supplies of aromatic hydrocarbons.

In 1950, petroleum is supplying about 5,000,000 gal. of benzene, 50,000,000 gal. of toluene, and 50,000,000 gal. of xylenes. The petroleum industry can supply unlimited amounts of aromatic hydrocarbons and future developments will provide more economical methods for their production.

Investment in Petrochemical Plants

The extent and diversity of the petrochemical industry at the present time is shown by the amount of money invested in the United States and projected future expenditures for plant expansion.

About 85 per cent of the petrochemical industry is concentrated along the Gulf Coast in Texas within a radius of 200 miles from Houston. The plants include those constructed and maintained by petroleum companies and chemical manufacturers.

Prewar, $65,000,000 would have covered the value of petrochemical plants in this area. During the war years both privately owned corporations and the Government invested about a billion dollars in chemical plants. Though there is considerable disagreement as to the exact value of these plants it is probable that the $1,000,000,000 is a conservative estimate. Since V-J Day, another $300,000,000 has been invested by private concerns and $250,000,000 more is earmarked for expansion projects.

TABLE 1—CHEMICAL PRODUCTS, PARTLY FROM PETROLEUM

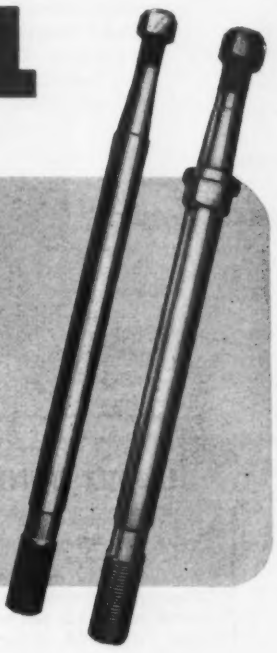
(Million pounds)

Year—	1900	1950	2000
Synthetic rubber*	0	800	4,000
Plastics	0	1,800	7,500
Synthetic detergents†	0	1,000	5,000
Insecticides	0	100	500
Synthetic ammonia‡	0	3,608	8,000

*Half petroleum based. †60 Per cent petroleum based. ‡43 Per cent from natural gas.

RED DEVIL

"DIA-HARD" PISTON RODS



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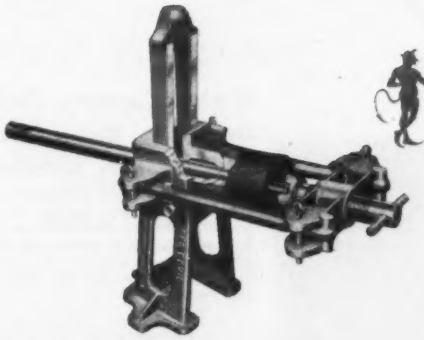
RED DEVIL Piston Rods are first choice where drilling conditions are severest because of the extreme hardness of the deep HIGH-CARBON wear resistant "DIA-HARD" case, coupled with tough core properties which give the highest tensile strength against breakage. All rods are hardness tested and precision gauged to maintain a world-wide reputation for quality. Write for Catalog No. P-101.



RED DEVIL PISTON PULLER

For tapered type rods

The usual practice of removing pistons from rods by blows of a sledge hammer often damages either pistons or rods. A Red Devil piston puller easily and quickly removes badly stuck pistons without injury to either part. All elements are made of finest quality alloy steel, heat-treated for strength and long life. Write for Catalog No. P-106.

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Complete information in Composite Catalog or write for price catalogs noted above. Red Devil products are available through your supply store.

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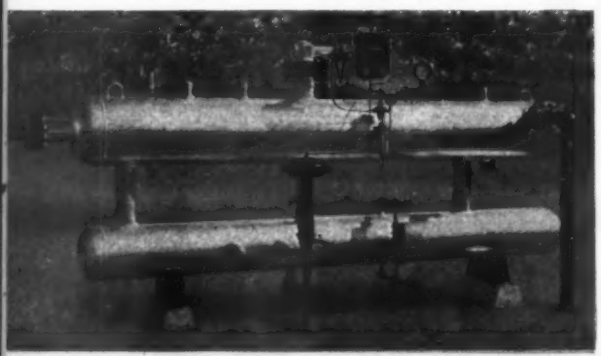

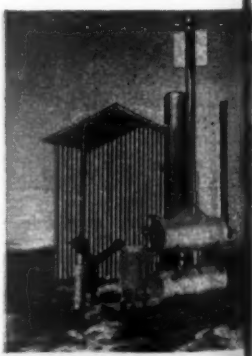

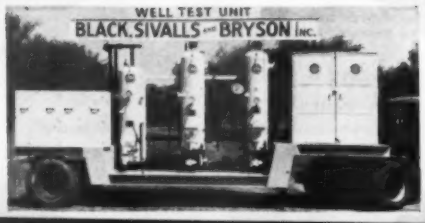

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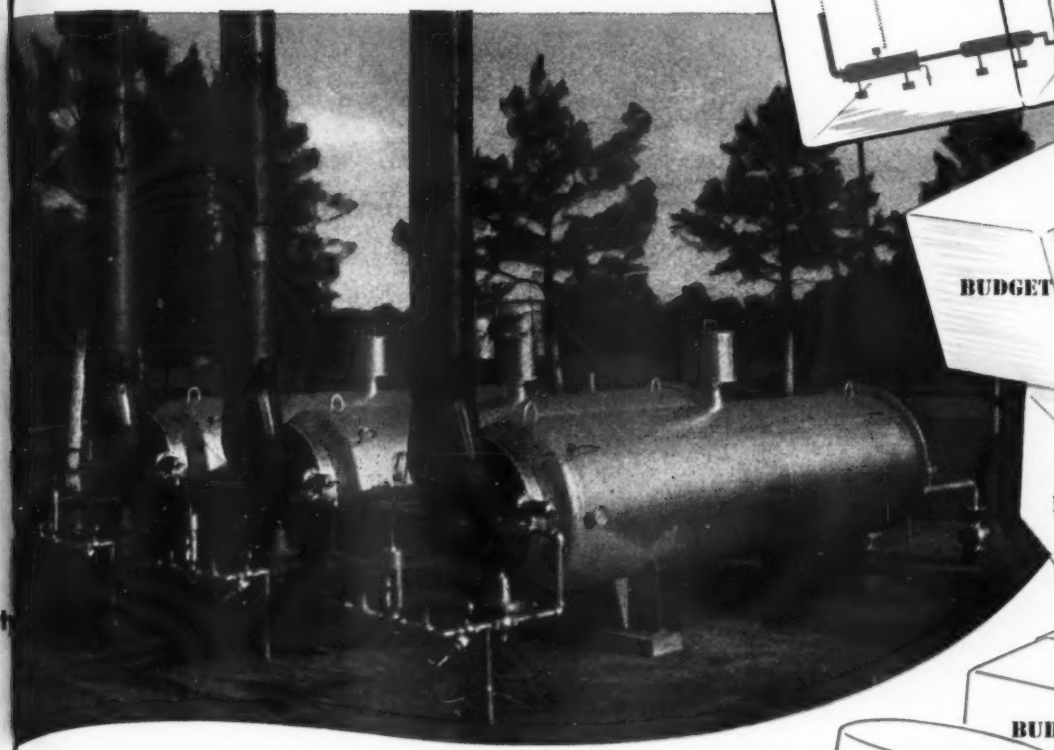

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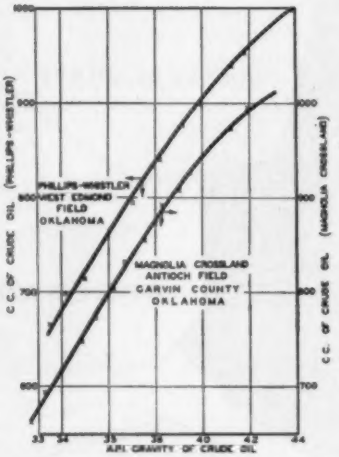
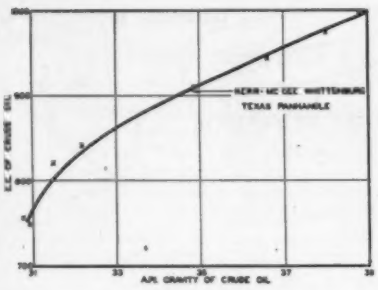
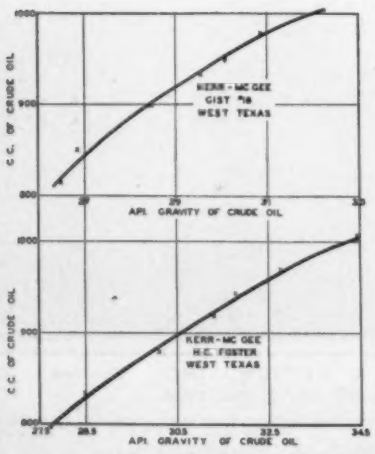
Economics of

REDUCING CRUDE-OIL VAPORIZATION LOSSES

by R. L. Huntington*







Figs. 1, 2, 3—Crude-oil shrinkage by evaporation vs. °A.P.I.

FOR a number of years, the petroleum industry has accepted the rule-of-thumb figure of 2.5 per cent volumetric shrinkage of Mid-Continent crude oil for each degree loss in °A.P.I. gravity. Since the weathering of crude oil involves the differential release of the lighter hydrocarbons, it seemed reasonable to assume a variable shrinkage per °A.P.I. loss of gravity in view of the changing composition of the hydrocarbon mixtures which are evolved from the crude oil.

Weathering tests have been made in open 1,000-cc. glass cylinders on seven Oklahoma and Texas crude oils. The results of these atmospheric tests are shown in Table 1 and Figs. 1 to 5 inclusive. It easily can be seen that the shrinkage increases with each degree (°A.P.I.) loss of gravity for all of these crude oils.

The last column in Table 1 shows differential volumetric loss per °A.P.I. to be greater since in this column each volume is compared with the volume of the crude 1° higher in A.P.I. gravity, rather than a comparison with the original crude-oil volume as shown in the next column to the left.

These studies bring out the important fact that the volumetric shrink-

*School of chemical engineering, University of Oklahoma, Norman.

TABLE 1—ATMOSPHERIC WEATHERING TESTS IN 1,000-CC. GRADUATED

1. Phillips Whistler—West Edmond field—Oklahoma County, Oklahoma

1949 date—	Volume (cc.) Start	Volume (cc.) Finish	A.P.I. gravity Start	A.P.I. gravity Finish	Per cent: Shrinkage per °A.P.I. basis 1,000 cc. stock-tank crude	Per cent: Differential shrinkage per °A.P.I. basis*
May 17	1,002	980	43.9	42.9	2.20	2.20
May 18	980	957	42.9	41.9	2.30	2.35
May 19	957	932	41.9	40.9	2.50	2.63
May 20	932	899	40.9	39.9	3.30	3.54
May 23	899	865	39.9	38.9	3.40	3.78
May 29	865	829	38.9	37.9	3.60	4.16
June 7	829	795	37.9	36.9	3.40	4.10
June 21	795	757	36.9	35.9	3.80	4.78
July 28	757	717	35.9	34.9	4.00	5.28
January 9, 1950	717	675	34.9	33.9	4.20	5.90

Average shrinkage from 43.9° to 33.9° A.P.I. = 3.27% per °A.P.I.
A.P.I. gravity of total portion of crude oil evaporated = 69.5

2. Magnolia-Crossland—Antioch field—Garvin County, Oklahoma

May 7	1,002	981	42.6	41.6	2.10	2.10
May 8	981	957	41.6	40.6	2.40	2.50
May 12	957	930	40.6	39.6	2.70	2.82
May 18	930	897	39.6	38.6	3.30	3.55
May 29	897	861	38.6	37.6	3.60	4.01
June 9	861	823	37.6	36.6	3.80	4.41
June 28	823	784	36.6	35.6	3.90	4.73
August 17	784	742	35.6	34.6	4.20	5.29
October 15	742	702	34.6	33.6	4.00	5.38
January 9, 1950	702	663	33.6	32.6	3.90	5.57

Average shrinkage from 42.6° to 32.6° A.P.I. = 3.37% per °A.P.I.
A.P.I. gravity of total portion of crude oil evaporated = 67.5

3. Kerr-McGee—Whittenburg—Texas Panhandle

September 25	1,000	979	39.0	38.0	2.10	2.10
September 27	979	958	38.0	37.0	2.10	2.15
October 3	958	935	37.0	36.0	2.30	2.40
October 12	935	913	36.0	35.0	2.20	2.35
October 30	913	890	35.0	34.0	2.30	2.52
November 20	890	863	34.0	33.0	2.70	3.03
December 15	863	828	33.0	32.0	3.50	4.06
January 9, 1950	828	770	32.0	31.0	5.80	7.00

Average shrinkage from 39.0° to 31.0° A.P.I. = 4.12% per °A.P.I.
A.P.I. gravity of total portion of crude oil evaporated = 73.0

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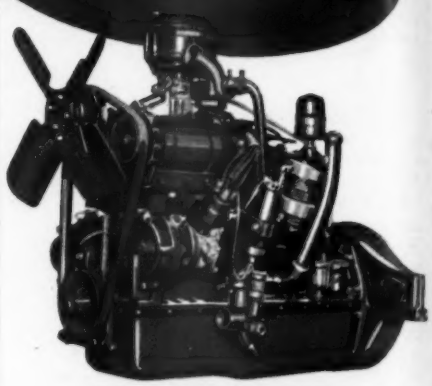
- ★ Heavy duty 4 or 5 speed transmissions of ample torque capacity for—quiet operation—easy shifting.



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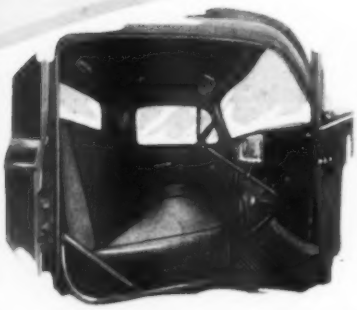

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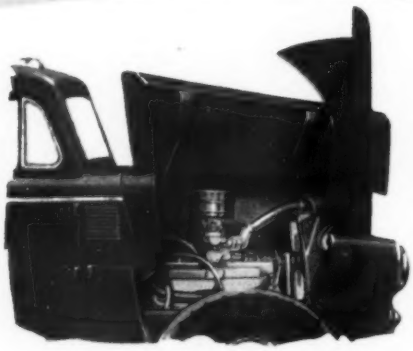
Seats accommodate three large men easily and are readily adjustable. Cabs are double insulated for all-weather protection.

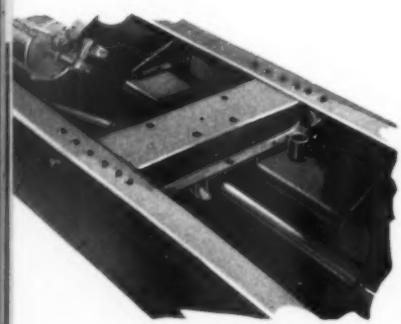


100% GREATER ACCESSIBILITY

New, exclusive "Swing-Lift" fender simplifies maintenance on engine, steering, front brakes, etc.—reduces down time—cuts repair costs.

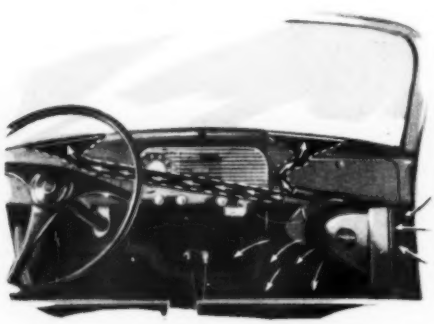
60% GREATER VISION

One piece, full width, bent safety glass windshield insures maximum visibility—eliminates distortion. Dual electric windshield wipers standard equipment.



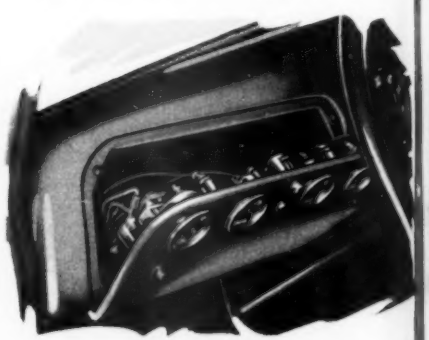
30% GREATER STRENGTH

Massive, sturdy frame side rail dimensions substantially increased and cold riveted for maximum strength and durability.



ALL-WEATHER AIR CONDITIONING

Fresh air heater and defroster is available with cowl intake vent, thermostatically controlled for all-weather driving comfort.



ACCESSIBLE WIRING PANEL

Electrical wiring under cowl is readily exposed by opening a door in instrument panel. Wires are colored for easy tracing of circuits.

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age runs much higher for every degree lost by the lower-gravity crude oils such as those in the areas where emulsion treating has to be carried on. It is only another argument for the installation of heat transfer equipment (Fig. 6) which can bring the temperature of the treated crude oil down to those temperatures which exist on leases producing clean crude oil.

Crude-Oil Cooling System

The loss by evaporation of the lighter hydrocarbons can be reduced on certain volatile crude oils by lowering the temperature of the warm treated oil on its way to atmospheric storage (Fig. 7). In the usual operation, crude oil may flow from the well or the treating plant at a temperature of 10° to 40° F. above that of the normal stock tank. A part of the sensible heat in the oil is transferred to latent heat as the result of adiabatic cooling of the oil and the loss by vaporization of invaluable gasoline fractions. By an enthalpy balance this evaporation loss can readily be shown to be approximately 3.5 per cent for every 10° F. of adiabatic cooling of the crude oil.

The transfer of sensible heat from the warm crude oil which flows directly from the well or treating system to storage should take place in a tube-and-shell exchanger. The cooling medium may be water or any other refrigerant depending upon the degree of cooling desired.

If the demand for lighter gasoline fractions is exceptionally strong, further removal of heat from the crude oil might be economical. This cooling could be done after the crude oil has reached the atmospheric storage tank by pumping cool water through coils submerged immediately below the surface of the liquid in the storage tank. The cooling of the oil on the surface would increase its density and cause it to sink, thus setting up convection currents which would result in the cooling of the oil throughout the tank.

A high liquid level for the oil is maintained continuously by the transfer of water from one tank to another. In other words the water level would be lowered simultaneously with the influx of crude oil into the tank. The reduction in vapor space at all times would reduce the breathing losses between night and day. The water should be kept cool so that the crude oil when turned into a new tank (full of water) would give up additional sensible heat by direct contact through the oil-water interface, and thereby bring about a closer approach to the temperature of the previously cooled water.

Each oil field presents itself as an individual problem insofar as the

(Continued on page 122)

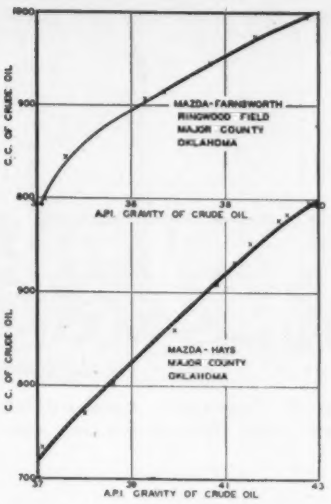


Fig. 4—Crude-oil shrinkage by evaporation vs. °A.P.I.

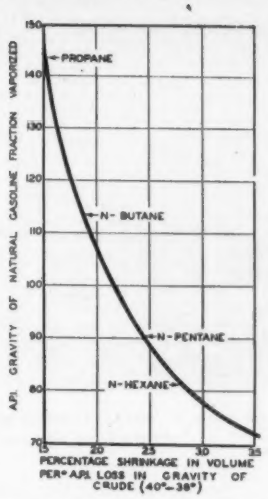


Fig. 5—A.P.I. gravity of evaporated portions vs. shrinkage of crude oil per °A.P.I.

CYLINDERS ON SEVEN REPRESENTATIVE OKLAHOMA-TEXAS CRUDE OILS

4. Kerr-McGee—Gist No. 18—West Texas

1949 date—	Volume (cc.) Start	Volume (cc.) Finish	A.P.I. gravity Start	A.P.I. gravity Finish	Per cent: Shrinkage per °A.P.I. basis 1,000 cc. stock-tank crude	Per cent: Differential shrinkage per °A.P.I. basis*
September 26	1,000	978	33.6	32.6	2.20	2.20
September 27	978	950	32.6	31.6	2.80	2.86
October 5	950	919	31.6	30.6	3.10	3.26
October 25	919	887	30.6	29.6	3.20	3.27
November 20	877	845	29.6	28.6	4.20	4.73

Average shrinkage from 33.6° to 28.6° A.P.I. = 3.3% per °A.P.I.
A.P.I. gravity of total portion of crude oil evaporated = 65.5

5. Kerr-McGee—H. C. Foster—West Texas

September 26	1,000	980	34.3	33.3	2.00	2.00
September 27	980	953	33.3	32.3	2.70	2.76
October 2	953	923	32.3	31.3	3.00	3.15
October 11	923	892	31.3	30.3	3.10	3.36
November 1	892	858	30.3	29.3	3.40	3.82
December 2	858	823	29.3	28.3	3.50	4.08

Average shrinkage from 34.3° to 28.3° A.P.I. = 2.78% per °A.P.I.
A.P.I. gravity of total portion of crude oil evaporated = 70.5

6. Mazda-Farnsworth—Ringwood field—Major County, Oklahoma

September 14	1,000	977	39.9	38.9	2.30	2.30
September 15	977	950	38.9	37.9	2.70	2.84
September 19	950	921	37.9	36.9	2.90	3.15
September 27	921	891	36.9	35.9	3.00	3.37
October 30	891	858	35.9	34.9	3.30	3.84
January 9, 1950	858	800	34.9	34.1	7.25	9.05

Average shrinkage from 39.9° to 34.1° A.P.I. = 3.45% per °A.P.I.
A.P.I. gravity of total portion of crude oil evaporated = 67.5

7. Mazda—Hayes—Major County, Oklahoma

September 14	1,000	965	43	42	3.50	3.50
September 17	965	920	42	41	4.50	4.67
October 2	920	870	41	40	5.00	5.43
October 20	870	825	40	39	4.50	5.17
November 20	825	775	39	38	5.00	6.06
January 9, 1950	775	720	38	37	5.50	7.10

Average shrinkage from 43° to 37° A.P.I. =4.67% per °A.P.I.
A.P.I. gravity of total portion of crude oil evaporated = 60.8

*Residual crude-oil volume next °A.P.I. higher.

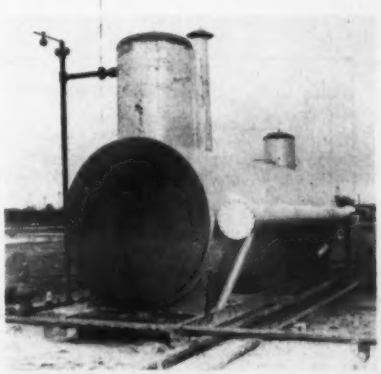
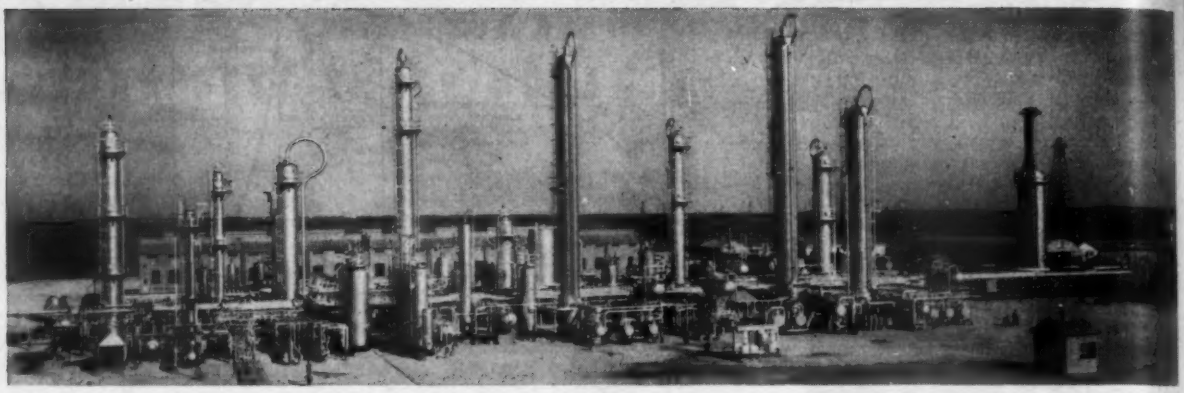


Fig. 6—Crude-oil emulsion treater equipped with heat exchanger (cool emulsion to treater against hot treated crude oil to storage).



This new plant is located 17 miles northwest of Andrews, Tex., Andrews County. Plant capacity is 38 million cubic feet daily. Gas is drawn from 65 tank batteries. View shows process area, with compressor building in the background.

South Fullerton Gasoline Plant Good Example of Conservation And Producer Cooperation

by J. M. Hillsman* and E. W. Kilgren*

THE South Fullerton gasoline plant, serving the south portion of the Fullerton field in Andrews County, Texas, is another example of casinghead-gas conservation that has resulted from joint efforts of oil producers. The plant is jointly owned by 10 companies and 5 individuals. Its owners are Stanolind Oil & Gas Co., Mid-Continent Petroleum Corp., Texas Pacific Coal & Oil Co., Superior Oil Co., Gulf Oil Corp., The Texas Co., Anderson-Prichard Oil Corp., Elizabeth F. Frankel, British American Oil Producing Co., Bay Petroleum Corp., Pearl Frankel, Champlin Refining Co., Paul F. Barnhart; Donald Frankel, and Harding Frankel. Stanolind is the plant operator.

Fullerton field was discovered in

*Stanolind Oil & Gas Co., Tulsa.

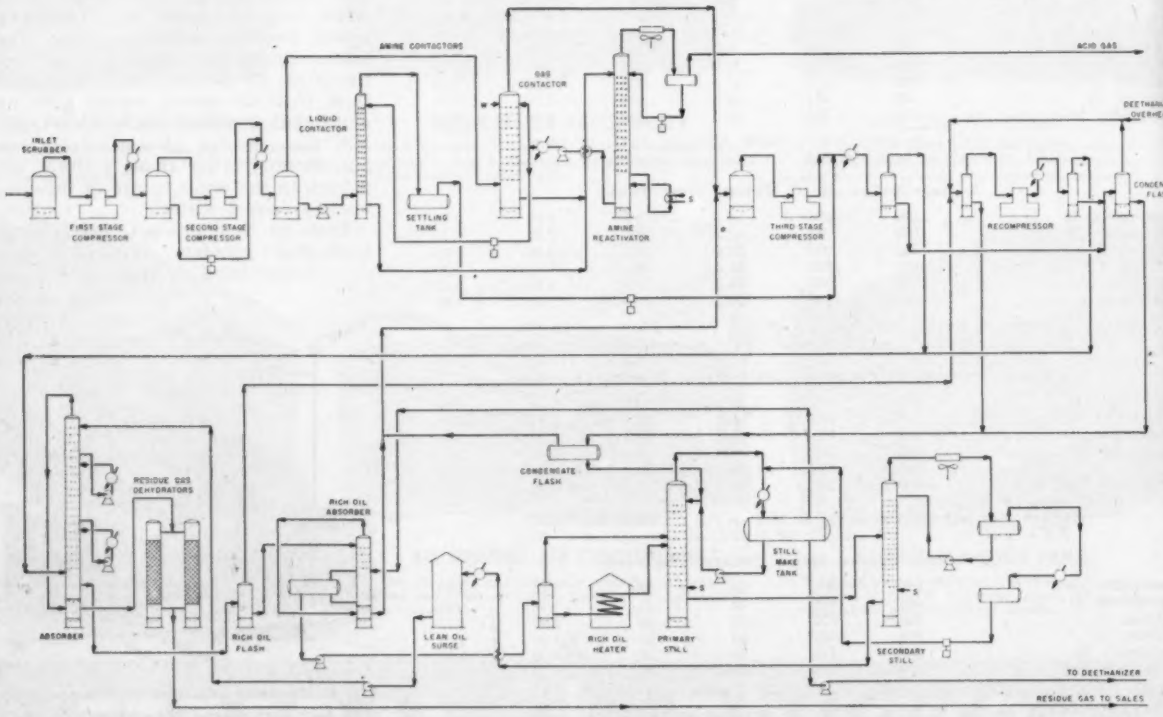


Fig. 1—Flow diagram of compression, H_2S removal, dehydration, absorption and distillation.

February 1942 by Fullerton Oil Co. The Clearfork zone is the major oil reservoir; however, five other zones have been classified as productive: Upper Clearfork, Wichita, Albany, Devonian, Wolfcamp, and Ellenburger. The field is approximately 13 miles long and 5 miles wide with the longer axis lying in a north-south direction.

During early stages of field development, Stanolind, Mid-Continent, and the Frankel interests, owners of extensive leases in the south portion of the field, applied for PAW permission to build a casing-head-gasoline plant. Clearfork productive acreage did not prove to be as extensive as was anticipated, and plans for the plant were suspended temporarily. With continued development of deeper horizons, discussions regarding installation of a plant were resumed in the early part of 1947.

Construction of the South Fullerton plant was begun March 1, 1949, and gas was started to the plant January 31, 1950. Construction work was completed during February. The plant is designed for an ultimate capacity of 55 million standard cubic feet of gas per day, but presently has compressor capacity for only 38 million feet per day. When processing 38 million feet of gas per day of the following expected composition, the plant can recover 80,000 gal. per day of propane, 50,000 gal. per day of butane, and 50,000 gal. per day of debutanized gasoline.

GAS COMPOSITION

Component—	Mol %
Nitrogen	3.66
Hydrogen sulfide	.51
Carbon dioxide	.48
Methane	64.47
Ethane	13.93
Propane	9.16
Butanes	4.45
Pentanes	1.99
Hexanes	.90
Heptanes and heavier	.45
Total	100.00

The processing cycle employed is similar to that of the normal oil-absorption plant, but it does have a number of unusual features. A six-plate rich-oil absorber is utilized to absorb a large portion of the propane and heavier components contained in the still make-tank vapors. Overhead vapors from this absorber, along with low-pressure condensate flash vapors, are recompressed through the third-stage compressor and sent to the main absorber for final removal of the desired products. Other flash vapors are recompressed in a separate recompressor for recycle to the main absorber.

The field gas-gathering system collects separator gas from 65 tank batteries. The system is designed to collect gas from the separators operating at 10 psig. and to deliver the gas to the plant at 2 psig. Branch lines connecting the well batteries feed two main delivery lines. The field system also includes a residue gas system to return dry sweet gas to all leases.

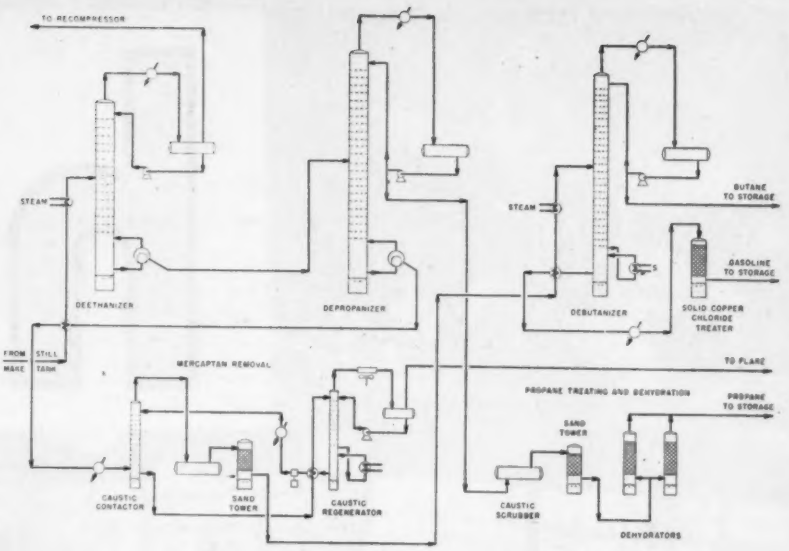


Fig. 2—Fractionation and product treating.

Gas Compression, H_2S Removal, and Dehydration

Schematic arrangement of compression, H_2S removal, dehydration, absorption, and distillation facilities is given in Fig. 1. Plant field gas compressors consist of seven 1,600-hp. (sea-level rating), two-cycle, right-angle gas-engine-driven units designed to compress approximately 38,000,000 cu. ft. per day gas from 2 to 700 psig., and to compress approximately 5,400,000 cu. ft. per day of cycle vapors from 220 to 700 psig. A 400-hp. 2-cycle unit is used to recompress approximately 7,200,000 cu. ft. of cycle vapors from 425 to 700 psig.

Wet gas from the field enters the plant through two 9 by 12-ft. vertical scrubbers where entrained water and crude oil are trapped out. From this scrubber, gas enters the first-stage suction header at a pressure slightly above atmospheric, and is compressed through two stages to approximately 225 psig.

Sour gas and condensate from the two stages of compression are separated and sent to the acid-gas-removal system. Condensate is pumped through a packed tower countercurrently to amine solution. The gas is passed through a bubble tower for contacting with amine solution. The foul amine solution from these columns is combined and sent to the reactivator after heat exchange with the hot reactivator bottoms.

The reactivated amine solution, after heat exchange, is pumped through coolers to the gas and liquid contactors. The reactivator overhead vapors, consisting of acid gases and steam, are passed through an air-cooled condenser where most of the steam is condensed. The condensate from the overhead vapors is pumped back to the tower as reflux. The trap-out type reboiler is heated with exhaust steam from process pumps.

Sweet gas from the amine contactor is joined by recycle vapors from the 265-psig. compressor condensate flash and the rich-oil-absorber residue. These combined streams are compressed to 700 psig. by the third-stage compressors. Sweet condensate from the amine contactor is joined with the

TABLE 1—SOUTH FULLERTON TOWER SCHEDULE

Service—	Size	Normal operating press., psig.	No. of trays
1. Amine contactor for condensate	3 ft. 0 in. x 48 ft. 0 in.	275	1½-in. raschig rings
2. Amine contactor for gas	7 ft. 6 in. x 50 ft. 0 in.	225	20
3. Amine reactivator	5 ft. 0 in. x 61 ft. 0 in.	12	2-in. raschig ring
4. Main absorber	6 ft. 0 in. x 72 ft. 9 in.	700	25
5. Residue gas dehydrators (2)	5 ft. 6 in. x 34 ft. 0 in.	685	.....
6. Rich-oil absorber	6 ft. 0 in. x 30 ft. 0 in.	225	6
7. Primary still	7 ft. 0 in. x 55 ft. 0 in.	240	20
8. Secondary still	5 ft. 6 in. x 63 ft. 0 in.	70	24
9. Deethanizer	7 ft. 0 in. x 68 ft. 0 in.	460	29
10. Depropanizer	6 ft. 6 in. x 91 ft. 0 in.	240	40
11. Caustic contactor	3 ft. 6 in. x 30 ft. 0 in.	160	8
12. Caustic regenerator	3 ft. 6 in. x 34 ft. 0 in.	13	10
13. Debutanizer	5 ft. 6 in. x 81 ft. 0 in.	115	36
14. Propane driers (2)	4 ft. 0 in. x 18 ft. 0 in.	225	.....
15. Copper chloride treaters (2)	6 ft. 6 in. x 17 ft. 7 in.	25	.....

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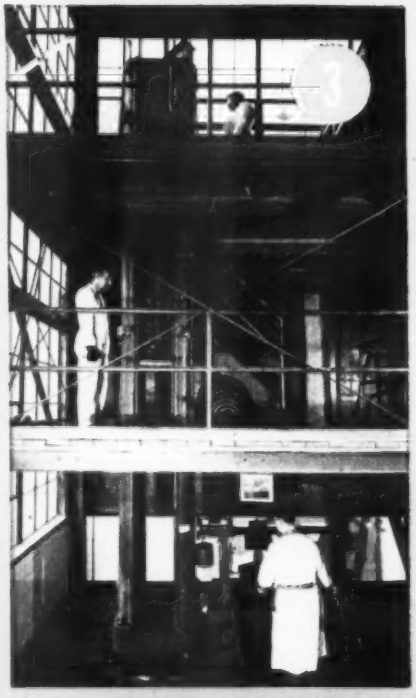

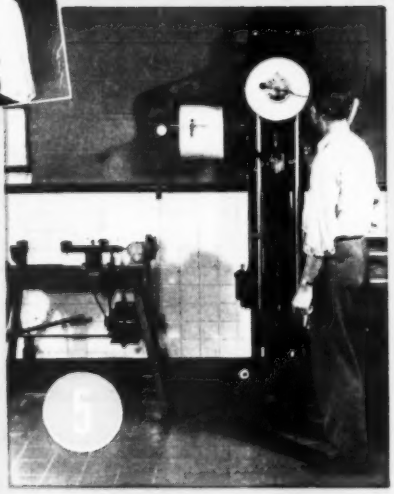

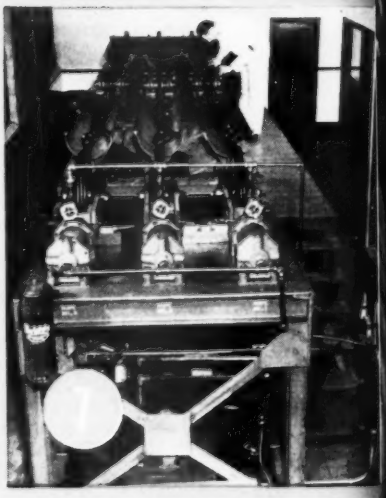

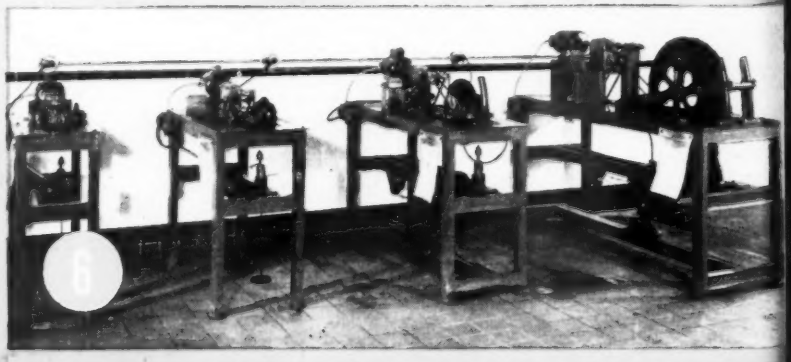

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... Wire Rope Problems are Studied in the Field ... and Whipped in Union Wire's Outstanding Research Laboratory by Technical Experts ...

Not content to sit back and make wire rope as it has always been made—just because it has always been made that way—

Union Wire Rope engineers continuously study problems in the field—bring them into the outstanding Union Wire Rope laboratory—and keep them under constant research until whipped and tested in the field.

The result is a growing line of new wire rope constructions, designed for specific uses, covered by the simplest kind of specifications and identified by the trademarked name TUFFY. Here are some of the steps taken to pre-determine Tuffy toughness that assures longer life.

1. Microstructure Tester. Under powerful magnification, Union Wire metallurgists examine the microstructure of the steel in rods and wires to see that rigid specifications are met and maintained in processing.

2. Static Flexibility Tester. The demand of machinery engineers toward smaller sheaves and higher speed made it necessary for Union Wire Rope Engineers to adapt this standard machine in order to test static flexibility.

3. Rope Testing Machine. This 3-story high machine is designed to test and record the breaking strength of the rope when finished and ready for the customer.

4. Chemical Analysis Laboratory. Steel for Union Wire Rope is made to rigid specifications. Here rods and wires are chemically analyzed to make certain that the correct combinations of carbon, manganese, etc., are kept under control.

5. Wire Tensile & Torsion Tester. In tension and under torsion, this machine tests wires to see that they measure up to the extraordinary high level of strength and toughness mandatory in Union Wire Rope.

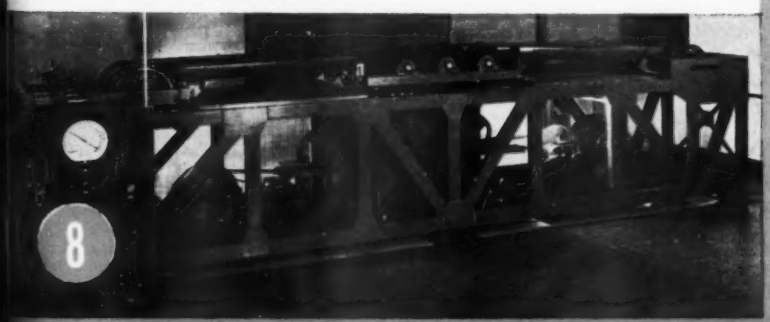
6. Wire Fatigue Testers. The fatigue strength of wire rope is the sum total of the fatigue strength of the wires in its construction. Here, the wires in tension and bending are tested for fatigue strength.

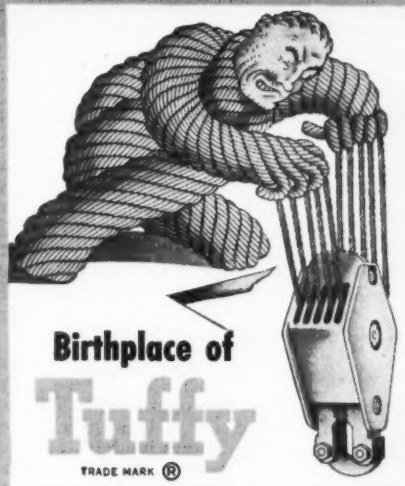
Wire Rope Accelerated Fatigue Tester — Only One of Its Type In Captivity

7. Top view—shows simultaneous testing of three different wire rope constructions. Here, in days, ropes are subjected to punishment equal to weeks or months of hard service.

8. Side view. Designed by Union Wire Rope Engineers, this accelerated fatigue tester is equipped with sheaves from 8" to 24" permitting application of any bending strain. Tensile loads up to 12,000 lbs. are applied. Thus wire rope life under toughest fatigue conditions is pre-determined.

After Union Wire Rope designs pass all of the exhaustive testing imposed by this array of highly specialized laboratory equipment and technical experts, Union Wire Rope engineers submit it to the final test. In the field, under actual working conditions, they confirm the longer life expectancy indicated by laboratory findings and determine proper application which in itself is vitally important.





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ROTARY LINE

For Jackknife and Standard Rotary Rigs...

Now, operators with rotary drilling line problems are a happier lot. For many months, Union Wire Rope engineers have been working closely in the field with many of them.

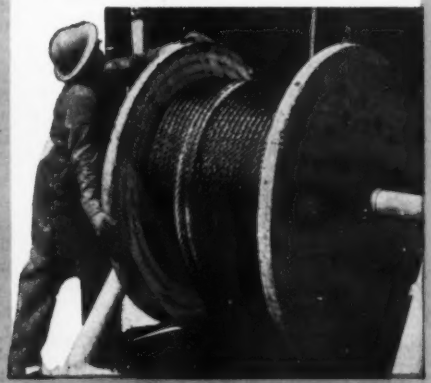
This, coupled with exhaustive laboratory research by technical experts, resulted in the development of the right combination of steel and construction to whip rotary line problems.

Field tested with good results, this new line, known as Tuffy Rotary, is in expanding production.

It is made for two operations—jackknife and standard rotary drilling. This simplifies ordering and delivering to you the proper grade of steel and construction to give you the ultimate low-cost rotary drilling line. There is no need to be confused with former complicated specifications. Just remember the name Tuffy. To write a typical order is as simple as this:

2500 feet, 1⅛ inch Tuffy Rotary Jackknife line, or 2500 feet, 1⅛ Tuffy Rotary Standard line.

Write today for an "in-person" presentation of full data.



union Wire Rope corporation

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compressed gas to aid condensation in the cooler. Gas from the discharge scrubber, along with the recompressor discharge vapors, is sent to the main absorber.

Condensate from the discharge scrubber joins the condensate from the recompressor and is flashed at 435 psig. This condensate is then joined by any condensate which might be collected in the recompressor suction scrubber and flashed to 265 psig. The vapors from this flash recycle to the third-stage compressors, and the liquid is used for washback in the primary still.

Absorption and Distillation

The main absorber, operating at 700 psig., is designed for a lean-oil circulating rate of approximately 500 g.p.m. Residue gas from the absorber is dried by solid-desiccant-type dehydrators to meet sales-gas specifications. The absorber is equipped with two intercoolers having a total duty of approximately 3,200,000 B.t.u. per hour. Rich oil from the absorber is flashed to 435 psig. Vapors are sent to the recompressor and the rich oil is sent to the 225-psig. rich-oil absorber to effect recovery from the still make-tank vapors. Rich oil from the rich-oil absorber is pumped through the rich oil-lean oil exchangers to a hot vent tank operating at 350 psig. and about 325° F.

Vent vapors flow directly to the primary still, operating at about 240 psig. The oil is further heated to 500° F. in a direct-fired heater before entering the still. Stripping steam is introduced at the bottom of the tower at a design rate of approximately 2,000 lb. per hour. Lean oil is washed back in the rectifying section by condensate from the 265-psig. compressor condensate drum at a design rate of about 200 g.p.m. A reflux pump for pumping from the make tank is provided to supplement the washback if necessary.

After being partially stripped in the primary still, the rich oil flows to the secondary still operating at about 70 psig. where it is completely stripped with steam at a design rate of approximately 6,700 lb. per hour. Reflux is obtained by cooling the overhead vapors to 160° F. with air cooling. The design reflux rate is 94 g.p.m. The net overhead is totally condensed by water cooling and is pumped to the primary still condenser to minimize the quantity of recycle vapors from the still make tank.

Fractionation and Product Treating

Process flow layout of fractionation and product treating facilities is shown in Fig. 2. Raw make from the still make tank is pumped to the deethanizer operating at 460 psig. The deethanizer feed is first heated to about 140° F. by heat exchanging with the depropanizer bottoms and is then further heated in a steam preheater to about 160° F.

The gross overhead vapors are partially condensed to make reflux and the vapors are sent to the recompressor. The tower bottoms are sent to the depropanizer where propane is the overhead product. Propane is pumped through a caustic wash to remove traces of sulfur compounds. It then passes through a sand filter to remove entrained caustic, and is dried in solid-desiccant-type driers. From the driers the commercial propane is run to storage.

Since Fullerton field gas is high in mercaptan content, it has been found practical to employ a regenerative caustic wash system ahead of the debutanizer. This pretreatment reduces the mercaptan content to such an extent that butane requires no further treatment, and the remaining mercaptan sulfur in the gasoline is readily converted to odorless and noncorrosive disulfides in the copper chloride treater.

Depropanizer bottoms, after heat exchanging with the deethanizer feed, are further cooled with water to 95° F. The stream then flows through a perforated plate column countercurrently to a 10 per cent sodium hydroxide solution, which is circulated at a design rate of 20 g.p.m. Spent caustic from the bottom of the contactor is regenerated in a small bubble tower utilizing stripping steam and a trap-out reboiler. The overhead vapors, consisting of mercaptan and steam, are sent to the flare.

The depropanizer bottoms flow from the contactor through a sand filter for removal of entrained caustic solution before entering the debutanizer. Butane is taken overhead and goes directly to storage. The gasoline, after being cooled, flows through the solid copper chloride treater to storage.

The deethanizer and depropanizer employ kettle-type reboilers utilizing 40-psig. exhaust steam. The debutanizer employs a thermosiphon reboiler utilizing 100-psig. exhaust steam.

A product delivery line was constructed to the nearest railroad, primarily for the delivery of propane and butane since most of the gasoline and some butane move from the plant via crude-oil pipe line. Five 1,375-bbl. horizontal tanks for propane, and three for butane, are located at the loading site. A 15-car doublespot railroad loading rack is provided.

At the plant site are three 2,500-bbl. spherical gasoline tanks, four 1,375-bbl. horizontal butane tanks, and six 1,375-bbl. horizontal propane tanks. Truck-loading facilities are provided for propane and butane.

Other storage includes two 5,000-bbl. tanks for raw water, a 50-bbl. domestic water tank, a 250-bbl. lube-oil tank, a 250-bbl. crude-oil tank, and a 500-bbl. absorption oil tank, and storage for caustic and acid.

Utilities and Buildings

Utilization of air coolers wherever practical helps to keep water requirements to a minimum. The two-still system, and the elimination of a reabsorber also aid in this respect by keeping steam requirements to a minimum.

The induced-draft cooling tower is designed to cool 15,000 g.p.m. of water from 98° to 80° F. with a 71° F. wet-bulb temperature. Water is supplied by three water wells about 13 miles from the plant. These wells are capable of delivering approximately 900 g.p.m.

Electric power is supplied by three 500-kw., 480-volt, 3-phase, 60-cycle electric generator units. Each generator is driven by an eight-cylinder, four-cycle gas engine.

The plant has three water-tube boilers rated at 40,000 lb. per hour each. Normally, all three boilers are fired, although two boilers are capable of handling the plant load. Steam is generated at 400 psig. and 700° F. Part of the steam is desuperheated by introducing condensate and goes to a 250-psig. system. The 400-psig. steam is used for all turbines and the 250-psig. steam is primarily used for reciprocating pumps and for primary still stripping steam.

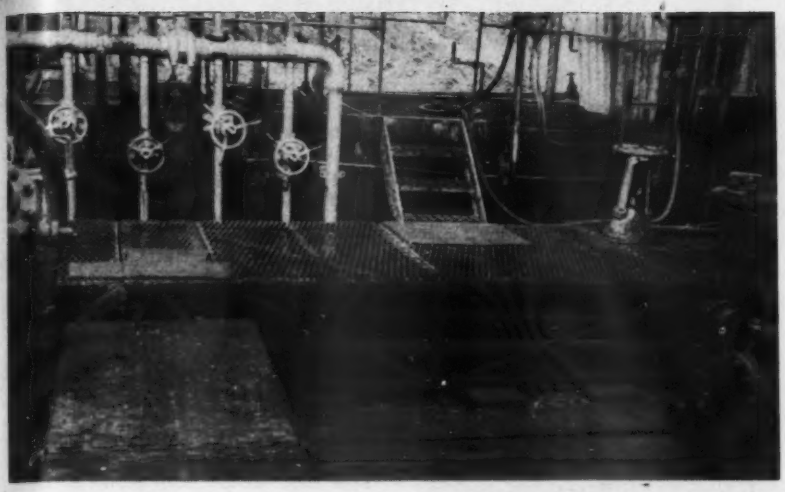
The evaporator and the turbines driving the lean-oil pumps exhaust into a 100-psig. system. The 100-psig. steam is used for steam stripping in the secondary stripper and for the debutanizer reboiler. A 40-psig. exhaust steam system supplies other processing requirements.

There are 13 buildings in the plant area. These include a 30 by 270-ft. compressor building; a 46 by 76-ft. change house, shop, and warehouse; a 50 by 60-ft. generator building; a 24 by 40-ft. boiler pump house; a 20 by 36-ft. fire-pump and fire-equipment house; an 18 by 40-ft. compressor jacket water pump house; a meter house; three instrument sheds; a small fire-equipment house, and one doghouse each for the storage area and the truck loading rack. All buildings are of steel-frame construction with roof and walls of corrugated galvanized iron.

BOOKS

PETROLEUM AND ITS PRODUCTS. By William J. Sweeney. Sponsored by Phi Lambda Upsilon and the Department of Chemistry, Pennsylvania State College, State College, Pa. $3.25.

This plastic-ring-bound volume contains the twenty-fourth annual Priestly lectures. The author is vice president, research and development, Standard Oil Development Co., New York. The five chapters of the book are (1) Occurrence, Production, and Resources of Petroleum, (2) Composition and Analysis of Petroleum, (3) Refining of Petroleum, (4) Chemical Products from Petroleum, and (5) Utilization of Petroleum Products. The lectures are presented in such a manner as to be intelligible and stimulating to a college junior as well as interesting and informative to specialists in narrower segments of the same field.



Walk section beside mud tanks, built with sufficient height that utility lines can be installed inside framework.

OPERATING IDEAS

Fabricated STEEL WALKWAYS

Provide drilling-rig safety and convenience

STANDARD OIL CO. OF CALIFORNIA has developed a series of steel walkways to be installed on drilling rigs so that employes may walk with safety and comfort regardless of weather and soil conditions. Each section of the series is tailored for its own particular position; construction is with frames made of heavy angle iron.

The walkway besides the mud tank is fashioned so that many of the utility lines can be permanently installed inside the framework and flanged to the manifolds and pumps when rigging up. Each section carries metallic conduit with wiring circuits and approved outlets, and fixtures are installed to simplify attaching various leads to lighting standards.

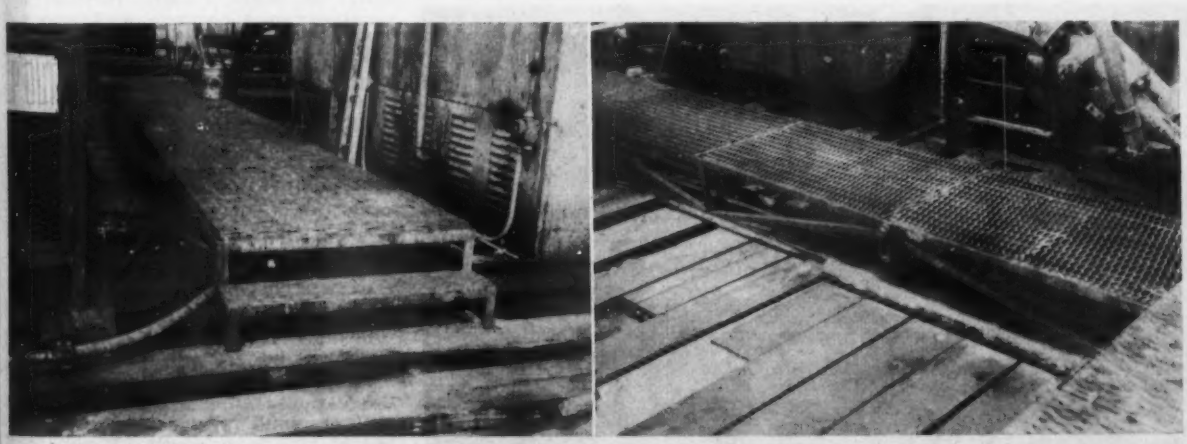
Each section is of similar pattern with bottom and top sills of angle iron stabilized with sway braces to form a rugged and substantial structure. The walkway frames are designed to be handled with rigging cranes or trucks equipped with a boom and wire-line winches.

For the convenience of the rigging crew, and to protect the sections, links are attached permanently at four positions: on either side near each end at a point where the first supporting riser is set. These links are cut by a welder from boiler plate to fit on pins with large heads which are securely welded to the top sill at the points of balance. Fitting loosely on the pins, the links always hang downward to eliminate obstructions which might cause an accident by stumbling, if they were fixed rigidly with part extending above the top level of the walk.

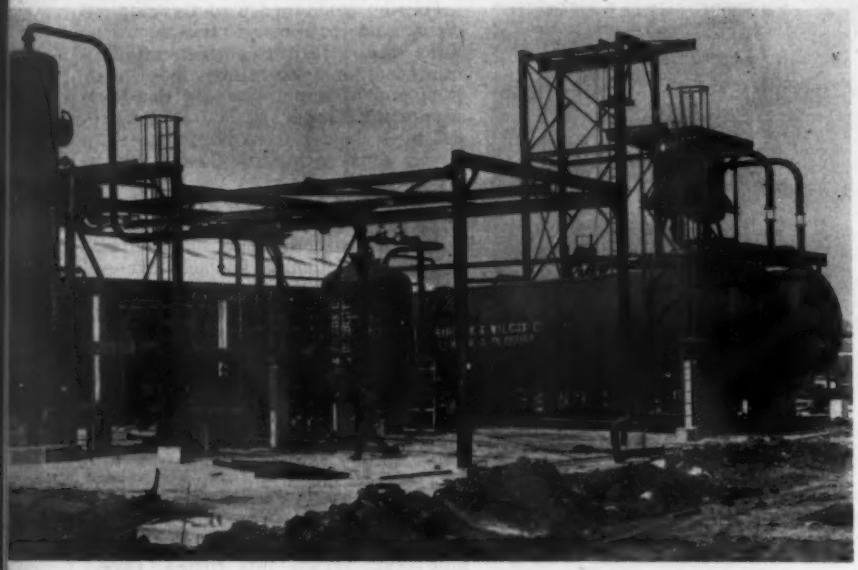
Treads on the walkways are expanded metallic mesh tread stock built into individual frames which can be easily removed for cleaning or repairing. The frames are shaped to fit snugly into the angle-iron top sills in the position for which they were built. For example, if a gate valve is placed on a header inside the walkway frame, the prepared hole must match this fitting. Likewise, the ends of the mesh frames coincide with the stabilizing cross members of the walk frames as additional support for the weight of men walking from one point to another.

A permanent step is attached to the end of the section placed between the pumps and the derrick substructure instead of using an 8 by 10 or some such piece of rig timber. Foundations for the walk sections are supplied with individual timbers which also extend beneath the pumps and engine skid members so that the same relative position is always maintained without extra cribbing.

The set of walkways always follows the rig from well to well, and the same pattern is used for rigging up so that each walkway serves its own purpose. Men may walk from the derrick floor to any point in the area without stepping into mud accumulations, or slipping on gel-covered planking, and the set of walkways is particularly useful when an oil-base mud is employed for circulation.



Left: Walkway between pumps and derrick substructure showing frame construction and built-in step for mounting at end. Right: Walkway section beside mud pump, showing link attached to frame riser for lifting with motor crane.



Installation of equipment for doctor-treating unit at new English refinery.

Construction on Shell Haven Refinery on Schedule

by V. S. Swaminathan*

OVER 2,200 men are busy on the construction of Shell Haven refinery a few miles from Southend, Essex, England. Work is being carried out under the direction of Sidney George Wraight, O.B.E., for some time in charge of the Suez refinery. With the Stanlow refinery on the Manchester Ship Canal the Shell Haven unit will handle more than 6,000,000 long tons of crude oil per year, and produce a complete range of finished petroleum products. As the Thames-side refinery gradually takes shape and more equipment is received, the labor force will be increased to 3,000.

Early this year construction was started on a 900-ft.-long tunnel under the Thames to carry cooling water for the Shell Haven refinery. This 9-ft.-diameter tunnel conveys river water from the Thames to a large pump house, now being constructed 30 ft. below ground level. Plans have been approved for erection, adjacent to the refinery, of 140 houses to accommodate permanent operating personnel. To provide suitable water, for both the housing site and the refinery, an additional large-diameter pipe line, about 30 miles in length, is being installed.

Developments on the refinery site include completion of more than 5 miles of concrete surfaced roads, together with 4.5 miles of railway sidings and distributive lines to handle the large volume of construction material and plant equipment being delivered daily.

The first distillation plant is designed to process 6,000 tons of crude oil per stream day. Notable feature of this plant is the high degree of control by instrumentation. Most of the operating pumping units will be electrically driven. A doctor-treating plant will provide facilities for treatment of approximately 1,300 tons daily of straightrun gasoline from the distilling unit. Also included in the primary refinery plan is the installation of pump and weigh-house fully equipped for TEL blending.

Additional refining facilities now under construction include a reforming unit which is scheduled for operation by May 1951. It will process nearly 1,200 tons per stream day of naphtha, or light gas oil. A feed-preparation plant having a design capacity of 2,500 tons per stream day for the production of bitumen feed stock, is scheduled for completion in November next year.

*V. S. Swaminathan, M.A., M.Sc. (Lond.), 5 Fielding Road, Bedford Park, London, W.4.

Construction of intake concrete ducting for cooling-water pump house.

Cooling and Condensing Equipment

Cooling and condensing equipment required in operating the above plants will be served with water pumped to the process area offtakes through the 9-ft.-diameter concrete duct. After circulation in the various vessels, the water returns through a similarly sized concrete duct into a large oil separator, thence being discharged back into the river. The water pump house measures 250 by 50 ft. with main pump units installed 30 ft. below ground level. These steam-turbine-driven pumps are of 2,600 g.p.m. capacity, and, eventually, units will be installed to deliver quantities of cooling water exceeding 80,000 g.p.m. Diesel-driven pumps of 2,500 g.p.m. capacity will also be arranged in this pump house specifically to deal with fire-fighting emergencies.

In the initial stages three 60,000-lb. per hour by 250 psig. Babcock & Wilcox boilers will supply steam to the various refinery plants and to general auxiliary equipment, pump houses, tank farms, shops, offices, etc. Layout design of the boiler plant incorporates facilities for the supply of

compressed air besides allowing for future installation of a duplicate set of boilers as development of the refinery proceeds.

Electric power for refinery operation is obtained by two main feeders branching from the Local Electrical Authorities Tilbury and Raleigh 33-kva. overhead systems to the refinery substation transformers, thus affording a twin-source supply with standby insurance against possible failure of either source. Power supply of 6,600 volts will be taken underground to local substations throughout the site, from which 415-volt power will be distributed to the required consumer points.

Provision of fresh water for a refinery consumption of 500,000 gal. daily necessitated the laying of about 15 miles of new cast-iron pipe lines by the county water board to a point about 2 miles from the site, thence by cross-country 16-in.-diameter all-welded pipe to storage tanks in the refinery. Chemical treatment to the raw water is necessary to insure adequate supplies of conditioned water to the boilers and other services.

An aggregate of roughly 550,000 cu. m. tankage is being arranged on the refinery site and adjacent tank farms for the handling of incoming crude oil, plant feed service, blending, and products storage. New 14,000-ton-capacity crude-oil storage tanks are being erected and the complete scheme is scheduled for final operation by November 1951.

Construction of refinery administrative, operational, laboratories, and engineering offices, together with canteen facilities for refinery personnel are nearing completion. Extensive storehouses, machine shops, and auto-repair shops have been in operation for some time for maintenance of construction equipment, and for fabrication of piping.

BOOKS

KENT'S MECHANICAL ENGINEER'S HANDBOOK. (Two volumes.) Twelfth edition. Published by John Wiley & Sons, Inc., 440 Fourth Avenue, New York. 3,000 pp. $8.50 per volume.

Comprising two separate, inclusive volumes, each written by a large staff of experts, the new "Kent" accurately reflects the developments in mechanical engineering which have been made since the eleventh edition was published in 1936. Volume I—"Design and Production"—has been edited by Colin Carmichael, editor of Machine Design; Volume II—"Power" was prepared under the supervision of J. K. Salisbury, division engineer, Thermal Power Systems Division of General Electric Co. Retaining the handy size and flexible binding of the previous edition, the new handbook has been completely rewritten in clear and accurate language. Although much of the material from the eleventh edition has been condensed, both volumes are now larger than their predecessors in order to present the most recent data and the latest practice. A new index, carefully worked out by the editors, makes each piece of information doubly accessible. A total of 168 specialists contributed to the volumes.

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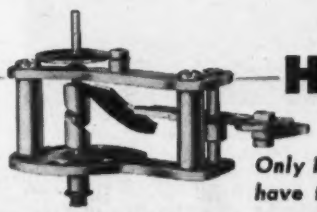

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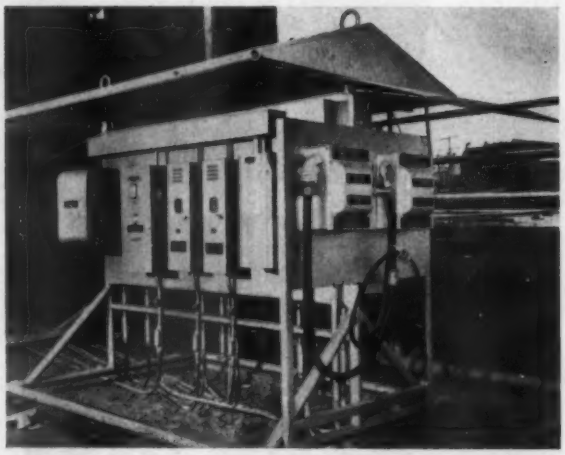


Portable Unitized Panel

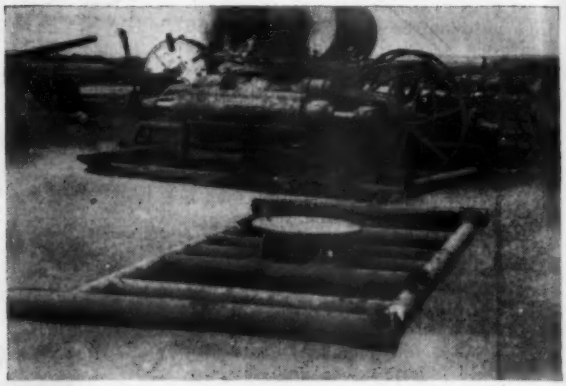
WITH all rig electrical boxes connected at this single panel, quick "tearing down" and "rigging up" is possible. Both high-line current and portable generators are adaptable to this board. It is made from 3-in. used pipe covered with lightweight steel. Two wings fold out on sucker rod bracing to form canopies to shed rain from the boxes. The roof is removable, and is attached to two short sections of pipe which fit into the larger pipe sleeves when in use.

Simple Vise Table

A STURDY vise table for use around the oil field can be made quickly by utilizing scrap lengths of pipe. The pipe is welded in the "U" shape as shown, with another cross bar welded in place to give a pinching effect to the large plank which serves as the vise bench. In use, the board is threaded through the two pipe legs and the unit is ready.

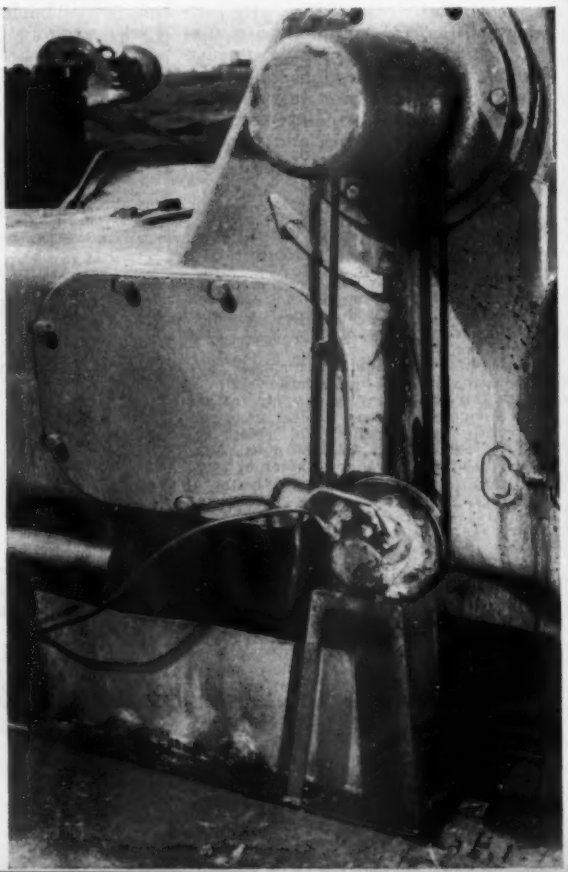
Skids Facilitate Handling of Large Blowout Preventers

HANDLING of large-size, bulky, blowout preventers is facilitated by the use of skids, such as those shown. Fabricated with 4-in. welded pipe, the skids provide a firm mounting for the blowout preventers for loading and unloading during rigging-up and tearing-down operations and are easily handled by a winch.



Packing, Replacing Costs Saved by Small Oil Pump

THIS tiny oil pump, mounted below the mud-pump shaft, saves packing and replacement costs. By forcing oil from a nearby pan to the mud-pump rods, this unit is proving very satisfactory. A slit, cut in the pulley-shaft guard, allows power to be taken from the shaft to the oil pump below. Diesel drippings from the rig engines are used in the proportion of 3 gal. of oil to 2 gal. of kerosine. A cover guard bolts over the belt drive.



QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Vaporization in Pipe Stills

When is it desirable to suppress vaporization in a furnace and what processes does this pertain to? When is maximum vaporization desired and in what processes? Shall quench be injected in the transfer line or fractionating column?—C. W. B.

All of these situations can hardly be brought together nor can the many possible process situations be rigorously explored all at the same time. Most properly, each process and its particular set of conditions should be considered separately because generalities are usually misleading. However, a few factors can be introduced in a professorial or academic manner:

1. Pressure drop.—Suppression of vaporization by an artificial means, such as a throttle or back-pressure valve, causes a somewhat larger pressure drop through the heating coil than when the fluid stream decreases in pressure at its own rate as it flows along through the coil. The difference in pressure drop by the two methods of throttling, however, is ordinarily not great.

All of this may be stated in another way. If the pressure of the vessel into which the coil dumps is raised to a high enough pressure to suppress all vaporization, the pressure at the furnace charge pump will be a little higher than if the vessel is held at a lower pressure.

2. Reactive remnants.—If the liquid contains high-boiling parts that are sensitive to heat or that would undergo reactions if held at the furnace-coil temperature for a period of time, it may be advisable to suppress vaporization. Vaporization concentrates the reactive material into the liquid phase and the liquid phase, if it became very small, might move through the coil very slowly. In the extreme the reactive liquid remnant might stick to the walls of the tube or might undergo chemical reactions (such as coking) before it left the coil.

3. Reactive vapors. — Theoretically at least, the reverse of Item 2 could occur. One example would be the vaporization of propylene from a benzene solution as in cumene manufacture. The propylene does not polymerize while dissolved in the solution because its concentration is not large. However, if vaporization occurred, the gas phase would be exceedingly rich in propylene and it would tend to polymerize, particularly if the pressure is high.

4. Avoiding stratification.—In computing or judging the rate of reaction, computations can be made with more accuracy if the material is totally in one phase, i.e., either vapor or liquid. Thus, it may sometimes be advisable to suppress vaporization in some instances and in others to do everything possible to encourage vaporization.

If it be impossible to produce a completely liquid phase, stratification can be avoided in some degree by the use of a high pressure. At high pressures, particularly pressures above the critical pressure, the vapor is so very dense that it is nearly as dense as the very hot liquid. In such a situation the liquid does not quickly or completely separate from the vapor. The larger of the two phases contains sufficient kinetic energy of motion to move the other phase along at a velocity nearly the same as the main bulk of fluid. This is the main reason for the use of a back pressure in conventional thermal cracking, coking, or reforming processes. In cracking, the temperature at the coil outlet is at or near the critical temperature and hence vaporization cannot be completely suppressed. A pressure equal to or higher than the critical pressure causes the vapor to be so dense that the unvaporized cracked fuel oil does not collect on the walls of the tubes.

5. Velocity.—Obviously, the formation of vapor greatly increases the linear velocity. High velocity is sometimes necessary if the transfer rate must be high and the film temperature must be kept low. Time for reaction can be regulated through wide ranges by decreasing or increasing the amount of vaporization. The effect of changing the temperature is usually not as positive as the changing of pressure.

The suppression of vaporization is often necessary in the handling of low-molecular-weight materials such as the semigaseous hydrocarbons, because when in the vapor state these materials occupy such a large volume that the velocity and pressure drop becomes prohibitively large, and times of reaction becomes vanishingly small.

6. Erosion.—Two-phase flow tends to cause more erosion than single-phase flow. Dense particles of liquid or solids (clay or catalyst) are carried along at a high velocity and are driven against the surface particularly at turns in the path of flow.

7. Quenching.—Processes differ widely with respect to the proper place to quench, i.e., at the heater outlet or in the vaporizer or fractionator. Even when considering a single process, some proponents recommend the still outlet and others the fractionator. Temperature often decreases in the transfer line. This tends to condense a crop of high-boiling (often reactive) material which may react to form a solid such as coke. Thus, for this particular instance quenching would be done at the coil outlet.

However, if pressure reduction is done at the coil outlet, vaporization tends to occur and produce such a high velocity that quenching may not be necessary at the coil outlet.

In most instances it is safest to do the quenching at the coil outlet, but in many instances satisfactory operation has been accomplished when quenching at the vaporizer or fractionator.

Crude Oil as Engine Fuel

We have heard of the use of crude oil as an engine fuel. Can you direct us to the manufacturer of the engine? R.P.S.

Careless statements of the press often lead to confusion. The fact that many products, including engine fuels, can be made from crude oil often leads the press to carelessly use the term crude oil rather than the name of the final product. Of course, certain select crude oils might be used and probably have been used as fuels for diesel engines. However, just any crude oil would not be satisfactory and special adjustments would be necessary for each of the few crude oils that could be so employed. Likewise, the distillate fluids produced from high-pressure gas fields are very much like gasoline and they can be used with fair success as engine fuels. The same applies to the use of drip gasoline from natural gas lines.

A unique installation was made by Black, Sivalls & Bryson at Guernsey, Wyo., for the production of gas from a crude oil. Local gas supplies were being exhausted and hence a tubular heater was installed by which crude oil could be heated by the exhaust gases from a gas engine. The heat was sufficient to vaporize the gases dissolved in the crude oil and to distill some of the gasoline or naphtha components. The gases from the crude oil are used as fuel for the gas engine. Obviously such an installation would be useful only in some isolated location.

XUM

Reducing Crude-Oil Vaporization Losses

(Continued from page 111)

economics of reducing vaporization losses is concerned. In some cases it is preferable to recover the lighter fractions of the crude oil in a natural-gasoline recovery plant. When the temperature of the crude oil in the flow line from the separator or treater to the stock tank is well above that of the atmosphere, water cooling should be considered. If the emulsified crude oil going to a treater is near or below the atmospheric temperature, the hot treated crude oil may be cooled by heat exchange with the emulsion stream, more economically than by the use of cooling water. A nearby stream or river may provide cool water which can be returned to the river as warm water. In order to save on heat-transfer surface the circulation of several barrels of water per barrel of crude oil being cooled is recommended. In this way the average Δt for the heat exchanger can be increased appreciably and the tubular area reduced correspondingly.

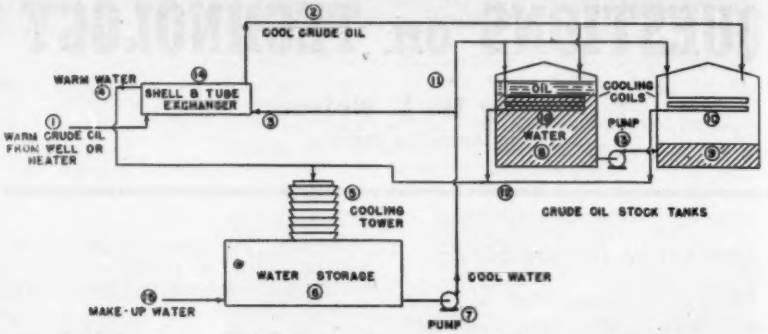


Fig. 7—Flow sheet of crude-oil cooling system for reduction of evaporation losses.

The quickest and most dependable method of determining the economics of cooling a treated crude oil is to take a sample of the oil as it leaves the treater by flowing the sample through a water-cooled tube into a gravity jar. If the A.P.I. gravity of this sample is as much as 0.5° to 1.0° A.P.I. higher than the gravity of the stock-tank crude, the economics of cooling the treated oil can be readily determined by balancing the cost of heat exchange against the volumetric loss of crude oil plus the difference in sale value between the higher and lower gravity brackets. For example, an increase of 1° A.P.I. crude oil from 37.6° to 38.8° for Antioch field would yield 3.6 per cent of a barrel or 9 cents based on $2.50 crude oil as well as 2 cents for the higher bracket. For a lease producing 500 bbl. per day a saving of $55 would be realized. Payout of an investment in a water-cooling system on a basis like this might be expected in a relatively short time under summer conditions, and taking into account operating costs such as labor, maintenance, water, and power.

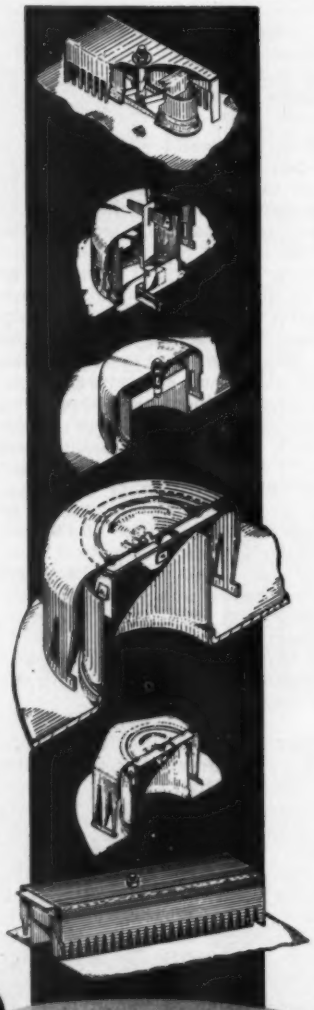
Acknowledgment

The author wishes to express his appreciation to the West Edmond Unit, the Phillips, Magnolia, Kerr-McGee, and Mazda Oil companies for supplying the crude-oil samples on which the weathering tests were made.

Butadiene Plant Award

BARTLESVILLE, Okla.—Plains Butadiene Plant, near Borger, Tex., operated by Phillips Chemical Co., has received the National Safety Council Award of Honor for distinguished service to safety.

WHAT SHAPE bubble cap do you like?



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Porosity Variations

THE statistical treatment of core data can be applied to porosity measurements as well as to permeability measurements, or, as a matter of fact, to any other core property. The means of expressing permeability data that have been presented are (1) the histogram, (2) the cumulative frequency curve, (3) the capacity distribution curve, (4) the cumulative capacity curve, and (5) the dimensionless cumulative frequency curve used by Stiles[1]. Each of these methods can also be used to express porosity data as the accompanying graphs illustrate.

Fig. 1 is a histogram of porosity based on data from Reference 2. Fig. 2 shows the same data as a cumulative frequency curve, Fig. 3 as a capacity distribution curve, and Fig. 4 as a cumulative capacity curve.

Fig. 2 is derived by adding each of the bars of Fig. 1 successively from left to right. The solid curve of Fig. 2 gives an averaging to the distribution and can be used to draw an average curve through the histogram of Fig. 1. Fig. 3 is derived by multiplying each bar of Fig. 1 by its average porosity and dividing the product by the sum of all such products to give a fraction of total capacity. Fig. 4 is obtained by adding each bar of Fig. 3 successively from the left to the right.

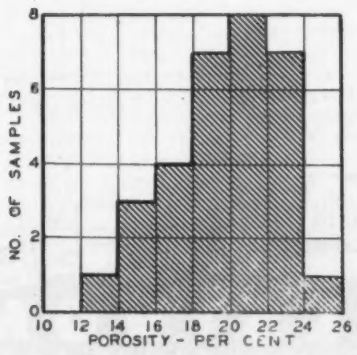

Fig. 1—Histogram or frequency distribution.

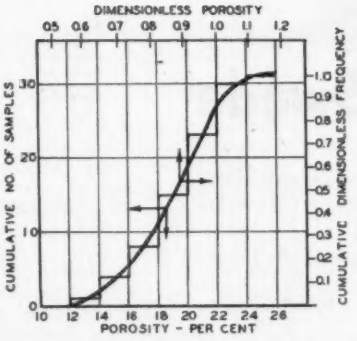

Fig. 2—Cumulative frequency or Stiles' dimensionless distribution.

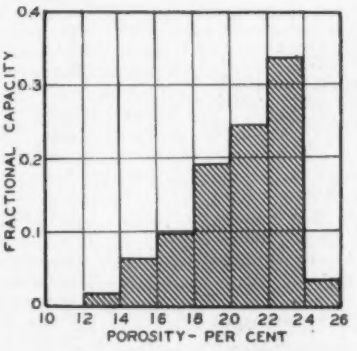

Fig. 3—Capacity distribution.

The second set of axis numbers on Fig. 2 shows the conversion of the data to a dimensionless basis in order to compare this porosity variation with other variations. This is the same technique used by Stiles in presenting permeability data. This is done by dividing the cumulative number of samples by the total number to give a fraction which denotes cumulative frequency and by dividing porosity values by the average porosity which expresses the deviation from the average porosity.

Fig. 1 shows the most probable porosity to be between 20 and 22 per cent. It also shows the probability that a new sample will be below 14 per cent or above 24 per cent to be 2/31 or 6.5 per cent. Fig. 4 shows that all values of porosity below 14 per cent could be excluded in computing net pay volume with an error of less than 2 per cent of the total capacity.

Both Figs. 1 and 3 show that the porosity distribution for this formation is skewed to the right, which does not in itself have any significance except as a means of comparison with other systems. The dimensionless curve of Fig. 2 has no meaning in itself except as a means of comparison with other systems to determine the degree of uniformity. If this formation were entirely homogeneous then the curve of Fig. 2 would be a vertical line through the homogeneous value of porosity.

References

1. Stiles, Use of Permeability Distributions in Water Flood Calculations, A.I.M.E. Trans. Vol. 186.
2. U.S.B.M., RI 3715, p. 84.

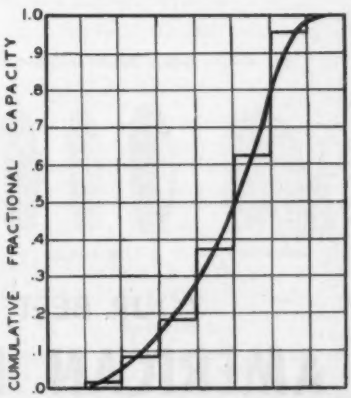

Fig. 4—Cumulative capacity curve.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

bellowed the Swede

We were down by the Swede's rig the other day when he gave out with a string of cuss words a mile long.

"What's wrong, Swede?" we asked.

"Those #&%()&! engines stalled again while I was picking up the string," he muttered.

"Wait a minute, Swede," we said. "Why not put Gýrol Fluid Drives on that rig?"

Then we explained how adjustable speed Gýrol Fluid Drives provide smooth starts against a full connected load by throttle alone . . . how any desired state of acceleration is possible without danger of stalling the engine.

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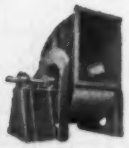
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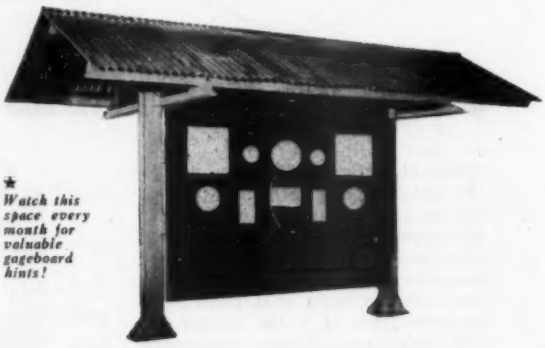

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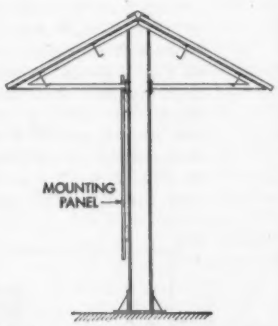

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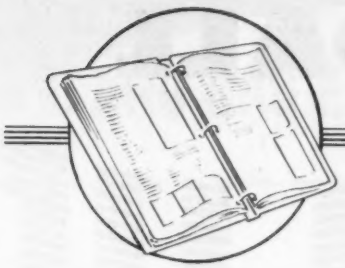

THE REFINER'S notebook

Power Units

INNER valve characteristics, flow rate, and pressure drop through control valves, and dampers have been discussed in The Refiner's Notebook. In this installment consideration is given to the power unit or "topworks" by means of which the inner valve is positioned.

Valve Operators

Control valves may be operated through solenoids (mostly for on-off application), hydraulically operated, electric-motor-driven, or air operated. Further differentiation as to type of valve operator can be made according to operating principle or construction. The hydraulic and air-operated power units, for example, may employ either a piston or a diaphragm in their operation. Furthermore, the pneumatic diaphragm-valve operator may be a spring-loaded device or may take the form of a pressure-loaded regulator operating without springs. In the latter, pressure due to the air or gas being regulated is applied to one side of the diaphragm, balancing controlled air pressure on the other side.

The pneumatic diaphragm (commonly known as a "diaphragm motor") power unit may be used to position a sliding stem valve or, through suitable linkage, to operate rotary-stem devices such as a butterfly valve. The basic action of the spring-loaded diaphragm mechanism has been noted previously (Refiner's Notebook, May 4, 1950). Essentially, this consists of balancing the force on the diaphragm due to pressure of the controller output air against the force in the compressed spring. Two other forces may be involved to a greater or lesser extent in this action. These are the unbalanced force or thrust on the inner valve due to pressure of the flowing fluid, and the force required to overcome stuffing-box friction.

Power-Unit Characteristics

Selection of a pneumatic diaphragm power unit involves consideration of the following: (1) range of operating air pressure, (2) effective diaphragm area, (3) spring-compression rate, (4) expected magnitude and variation of the unbalanced force or thrust on the inner valve, and (5) controller proportional band. Applied air pressure is normally in the range from 0 to 15 psi. However, in throttling control the actual operating range for intermediate positions between fully closed and fuly open may be, for example, from 2 to 13 psi. The remainder of the air-pressure range acts as a reserve to assure positive shutoff or full opening of the valve at the end of the stroke. Sometimes the applied air pressure may be in the range from 0 to 25 or 30 psi.

The force available to open or close the valve against spring pressure and possible internal thrust is the product of the air pressure on the diaphragm and the effective diaphragm area. In the design of the power-unit springs are selected with the proper spring load (i.e., force required to compress springs till the coils touch each other) and the appropriate total spring compression. The spring compression rate (pounds per inch) must be such as to produce the desired shift in valve position corresponding to a given change in air pressure on the diaphragm. Note that the springs used in power units ordinarily do not exhibit linear deflection over the range of compression.

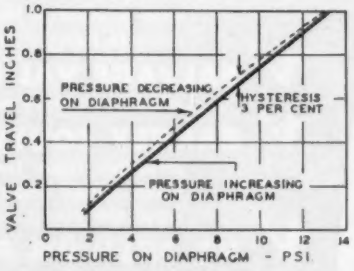

Fig. 1—Illustrating hysteresis in pneumatic diaphragm power unit.

Example: Given a 1,500-lb. spring and 1-in. maximum spring compression, the spring compression rate is 1,500 lb. per inch. Assume diaphragm effective area is 90 sq. in. If the pressure on the diaphragm changes by 0.5 psi. the change in loading on the diaphragm becomes $90 \times 0.5 = 45$ lb. Deflection of spring $= 45/1{,}500 \times 1 = 0.03$ in. The valve should therefore move 0.03 in. corresponding to a 0.5 psi. change in air pressure on the diaphragm.

Hysteresis.—An ideal power unit, operating with perfect diaphragm and spring action, no stuffing-box friction, and under conditions where there is complete absence of unbalanced force on the inner valve, would respond to the smallest change in diaphragm air pressure and be capable of placing the valve in exactly the same position whether operating on the upstroke or downstroke of the stem. An actual power unit exhibits a certain amount of hysteresis as illustrated in Fig. 1. Assuming a full stroke of 1 in., the valve will be positioned at about 67 per cent of its maximum travel with an air pressure on the diaphragm of 9 psi. when the diaphragm air pressure is being increased. When the valve is moving in the opposite direction (air pressure decreasing on the diaphragm) it is positioned to 70 per cent of its maximum travel, so that there is a hysteresis error of about 3 per cent.

References

Ross, S. D.; Instrumentation, No. 1, 1946, p. 16.

Werey, R. B.; Instrumentation, No. 6, 1945, p. 10.

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OIL AND GAS EQUIPMENT Digest

IT'S NEW — CHECK IT

TRADE LITERATURE

1 MATCHLESS LONG-TERM PROTECTION shows step by step, the application and protection rendered by the Insul-Mastic Vinyl system as applied to thermal insulation. Advantages and case histories are presented. *Insul-Mastic Corp. of America.*

2 FLO-SCOPE. A new bulletin describes air and gas flow rate indicators with improved design. Flo-Scopes, individually calibrated for the characteristics of the gases to be measured, are used with combustion equipment and in plants when accurate data about gas-air mixtures are required. *Selas Corp. of America.*

3 DOLLARS AND SENSE OF CATHODIC PROTECTION FOR TRANSMISSION AND DISTRIBUTION PIPE LINES. The 8-page booklet contains data on cathodic-protection case histories as well as factual information on the economics involved. Also included is a discussion of the requirements for successful cathodic protection. *Electro Rust-Proofing Corp.*

4 SEAMLESS CARBON STEEL PIPE PRICE DATA CARD. A new data card designed to help individuals involved in purchasing carbon steel pipe or estimating cost of apparatus using this material, tabulates the present-day prices per hundred feet of seamless carbon steel pipe 1½ in. in nominal diameter and smaller, in all quantity brackets. *Babcock & Wilcox Tube Co.*

5 VEECO MASS SPECTROMETER LEAK DETECTOR. Contents describe typical applications, wherever a vacuum, fixed pressure, or special atmosphere must be maintained for extended periods of time; principle of operation, features, and permanent data pertaining to vacuum testing and pressure testing. *Vacuum-Electronic Engineering Co.*

6 RYCROME AND NIKROME "M" HEAT TREATED ALLOY STEELS. A new four-page bulletin gives engineering data on two high-performance alloy steels supplied in the heat-treated condition, ready to use. Data tables include minimum mechanical properties, test results, properties at high temperatures, and machinability ratings. *Joseph T. Ryerson & Son, Inc.*

7 ACCURATE INSTRUMENTS describes temperature, pressure, level, and contents, controls; dial indicating and recording tank contents gages; vacuum indicating and recording gages; and pressure indicating, compound, differential, transmitting, and recording gages. Of particular interest is the liquid expansion system employed for indicating and recording temperatures. *Accurate Recording Instrument Co.*

8 BUFFALO STANDARD STORAGE TANKS is a four-page specification sheet on small and large horizontal storage tanks, field-erected tanks, and hydropneumatic storage tanks. *Buffalo Tank Corp.*

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Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, June 15, 1950

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COMPANY NAME .....
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OIL AND GAS EQUIPMENT Digest

9 STEAM TRAPS CATALOG NO. 250. This well-illustrated, 30-page book covers industrial steam, radiator, expansion steam, weight-operated, continuous-flow gasoline, and piston-operated traps, and three styles of separators. *W. H. Nicholson & Co.*

10 PFI STANDARDS. These standards, applicable to all types of pressure piping and compiled by Pipe Fabrication Institute, include such subjects as, "Machine Backing Rings and End Preparation for Butt Welds," "Standard Practice, Shop Hydrostatic Testing of Fabricated Piping," "Linear Tolerances, Bending Radii, Minimum Tangents," and "Method of Dimensioning Welded Assemblies." *Pipe Fabrication Institute.*

11 R. S. AND AC-ME TESTING INSTRUMENTS, a 32-page, illustrated bulletin, includes descriptions of cement, core, gas, and liquid testing instruments; deadweight instruments; and thermometers, manometers, sulfur-determination apparatus, calorimeters, and gager's thermoplumb bobs. *Refinery Supply Co.*

12 ALFRAME CHALET BUNGALOWS presents floor plans, elevation sketches, and specifications on construction, external and internal details, material, electrical and plumbing equipment, and roof construction. *Structural & Mechanical Development Engineers, Ltd.*

13 HEAT TREATING. This 54-page book, useful to anyone using alloy steels, contains information on heat treatment of steels, heat-treating methods, mechanical properties of alloy steels, and data and reference charts on critical points, carburizing depths, Ms calculation, and nitriding depths. *Republic Steel Corp.*

14 MATCHING DRILLING TRENDS presents a number of illustrated case histories of oil-field installations of Caterpillar engines. The eight-page booklet also gives range of horsepower ratings and an explanation of the company's field service. *Caterpillar Tractor Co.*

15 INDUSTRIAL PUMPS CATALOG 4906. In addition to data tables covering discharge size, dimensions and weights, and engineers' drawings, this fully illustrated, 36-page book discusses design principles, construction features, and materials of construction of a complete line of centrifugal pumps. *Nagle Pumps.*

16 RENTAL INSTRUMENTS explains fees, periods, packaging, shipping, and economy of rental service for infrequently used instruments. Complete information is given on recording a.c. ammeters, recording a.c.-d.c. voltmeters, recording wattmeters, current transformers, and graphic wattmeters. *InstruRental Co.*

17 SUPPLEMENTARY CATALOG DATA. This four-page folder describes and illustrates the various clamps, straps, and couplings at present available in the line. Detail of coupling cross-sections is included as well as basic specification information. *Marman Products Co., Inc.*

18 WELDING ACCESSORIES CATALOG. The 32-page booklet covers the M. & T. line of holders, helmets, cables, ground clamps, goggles, cleaning tools, and protective clothing, giving complete descriptive data and specifications. *Metal & Thermit Corp.*

19 EASTERN CENTRIFUGAL PUMP CATALOG. Description of Eastern centrifugal pumps for industrial applications is presented with complete engineering data, diagrams, and suggestions. Over 100 close-coupled models are available to pump from 0 to 70 psi., 0 to 70 g.p.m. These centrifugal pumps are available in special metals. *Eastern Industries, Inc.*

20 HD-19. A new 24-page catalog describing the HD-19 crawler tractor with torque-converter drive gives complete details on a host of attractions explaining the popular acceptance of this torque-converter-driven tractor. *Allis-Chalmers Manufacturing Co.*

21 FACTS. A new six-page, two-color bulletin illustrates design, construction, maintenance, operation, and application of rotary pumps. Details of sliding vanes and swinging vanes with selection table for specifying and other data of interest to engineers, maintenance men, and plant operators are included. *Blackmer Pump Co.*

FOR MORE INFORMATION . . . . use one of these cards

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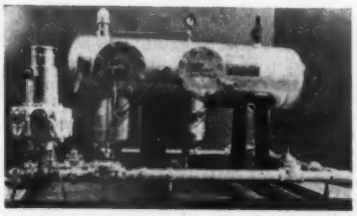
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

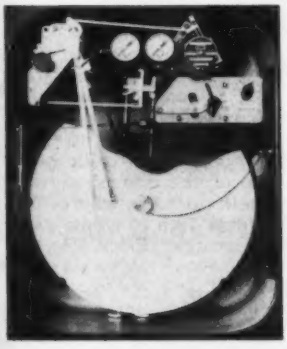
by Dan B. Miller

22 ROLO WELLCHECKER is A.P.I.-A.S.M.E. code-labeled to handle prorated wells and small strippers. With an oil and gas separator 16-in. by 4-ft. by 125-lb. working pressure, the equipment efficiently handles from 5 to 500 bbl. of fluid and a maximum of 200,000 cu. ft. of gas per day. It may be either trailer or skid-mounted. Where free water is prevalent, the unit may be equipped with automatic water knockout. Wellchecker now makes it practical for operators of prorated wells and small strippers to check well production daily and to secure accurate records for computing royalties and taxes. *Rolo Manufacturing Co.*



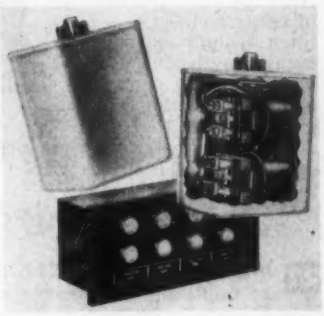
IT'S NEW CHECK IT

23 AIR-OPERATED CONTROLLERS are sensitive, precise, and fast in operation. Can be supplied with any of the control functions generally required for process work: on-off proportional control, automatic reset, and derivative action. Both nozzle and restriction have sapphire jewels to prevent wear due to dirt, water, or oil in the air. The nozzle is fixed with no adjustment possible. Restriction cleaning lever, easily accessible from the front, is provided to permit cleaning of the restriction while the controller is in service. Tubing connections have been greatly reduced in number through use of channeled passages in relay housing. *Penn Industrial Instrument Corp.*



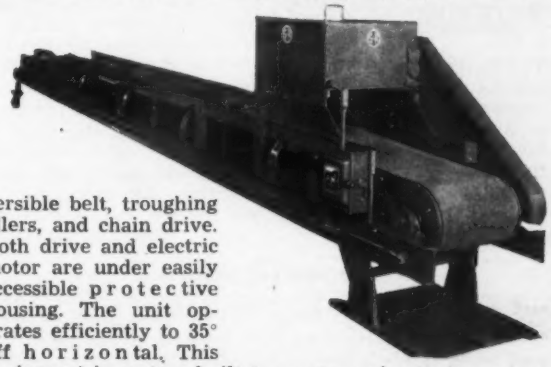
IT'S NEW CHECK IT

24 PANALARM SERIES 400. Units have hermetically sealed relays on a sealed plug-in octal socket for alarm signaling systems in hazardous locations and corrosive atmospheres. Many combinations of light and sound signals are available to warn of abnormal operating conditions. Application can be made for monitoring speeds, time cycles, pressures, temperatures, liquid or gas flow, or electrical or mechanical equipment operation. In normal operations, red and white lights are dim to indicate working order: In off-normal condition both signal lights go on bright, sounding warning horn. Operator responds by acknowledging button. This stops horn and turns off white light, leaving red light on. When corrective measures have been taken both red and white lights return to dim, and sounding device is back in service for monitoring and further failures. *Panalarm Products, Inc.*



IT'S NEW CHECK IT

25 MUD CONVEYORS FOR DRILLING-BARGE USE are built for heavy-duty service, equipped with reversible belt, troughing idlers, and chain drive. Both drive and electric motor are under easily accessible protective housing. The unit operates efficiently to 35° off horizontal. This equipment is custom built to meet requirements up to a maximum length of 40 ft. Units are in use by major companies and are proving an effective way to move drilling mud in offshore operations. *S & R Tool Co.*



The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

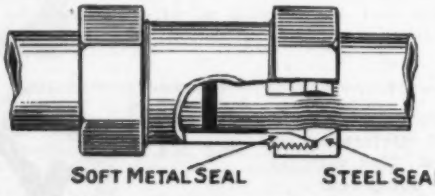
26 WOVEN-WIRE SLINGS are available in standard widths of 3 to 30 in. and from 36 to 132 in. standard lengths. Other sizes will be supplied on special order. Woven-wire slings are constructed from an adaptation of a basic mesh used in the fabrication of woven-wire conveyor belts. They are available in any metal or alloy, including stainless steels. Special tempered steel handles, attached to both ends of the sling itself, permit use of either a choke or basket hitch around the material being handled. They provide greater gripping power because of the width of the fabric and because of the cross-rod construction which permits the sling to bend around an extremely small radius. *Cambridge Wire Cloth Co.*

IT'S NEW CHECK IT

27 BACK RIP SCARIFIERS mounted on the backside of bulldozer moldboards, rip the ground when the tractor backs up, and float on top of the ground when moving forward. The teeth rip and loosen packed soil, black top, and hard ground. They rake out rocks and roots and smooth the ground, making forward blading easier and faster. Dead-head time is fully utilized. The equipment does not interfere at any time with blading operations. A set of scarifiers consists of four curved shanks capped lock-on replaceable teeth, each mounted in a separate housing which is welded to the back of the bulldozer moldboard. The teeth are made from the finest steel alloys to insure long life under the most rugged conditions. They can be raised and pinned out of the way when not in use. *Preco Inc.*

IT'S NEW CHECK IT

28 THREADLESS UNION FITTINGS rigidly connect black and galvanized pipe without threading of the pipe ends. They simplify the installation of plumbing by eliminating the necessity for threaded pipe. A hack saw and monkey wrench are all that is required. To break into an existing line with Threadless Union fittings it is necessary only to cut the line with a hack saw, part it ½ in., slip on a threadless tee, and tighten the sealing nuts. Tests at an accredited university laboratory bear out tests made in the company laboratory of over 2,000 psi. on these fittings. Fittings are made of steel with soft metal seals. They are manufactured for use with ½ to 1½-in. pipe, in tees, couplings, and elbows. *Union Products Co.*



IT'S NEW CHECK IT

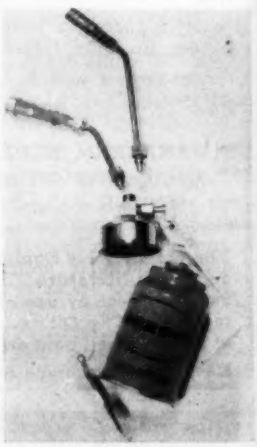
29 FORGED-STEEL STOP VALVES can be successfully installed in almost any service where small OS&Y steel globe or angle valves are used. Swing bolted packing glands and large packing chambers make any necessary repacking extremely simple. Interchangeability of parts greatly reduces maintenance inventories. Bronze yoke bushings prevent galling or freezing of stem. Available with bolted or union bonnets in sizes ¼ through 2 in. and with screwed or socket welding ends. Built of carbon or chromium molybdenum steel for two ranges of service conditions, they are rated for 600 lb. at 900° F. and 1,500 lb. at 850° F. for steam, oil, and gas service. *Edward Valves, Inc.*

IT'S NEW CHECK IT

30 ATOMAGNET. An entirely new and improved group of nonelectric Alnico plate magnets for separation of tramp iron from materials in process come in three models, each with a different magnetic strength: the Extrapower, the Ultrapower, and the Superpower. Each also comes in a full range of sizes. The magnet castings are fully encased with a formed cover. Parts are riveted rather than bolted together for added structural strength. The hinges on standard models are made of aluminum, continuous and offset. Insulation of the plate's working surface confines magnetic strength to area where it is desired. A flush air gap on the plate face prevents gathering of fine iron in this crucial location. *Eriez Mfg. Co.*

IT'S NEW CHECK IT

31 PREPO, a new self-pressuring, self-vaporizing fuel with a wide range of potential uses, is compounded of petroleum hydrocarbons and packaged in a disposable container which fits a hand torch. The torch which lights instantly with a match, does away with all pouring, pumping, and priming characteristic of ordinary blow torches. The fuel containers, which are the size of an ordinary beer can, are quickly sealed into position as the fuel tank of the torch. *Pressure Products Corp.*



IT'S NEW CHECK IT

OIC UNION BONNET BRONZE GATE VALVE

GIVES YOU MONEY-SAVING FEATURES YOU'LL WELCOME

This series of OIC valves (Figure nos. 7200, 7202 and 7208) is rated for working pressures of 200 pounds steam at 550°F.—400 pounds water, oil and gas, non-shock. Union bonnet screwed-end type. Solid wedge rising stem, double-disc rising stem and solid wedge non-rising stem designs. Tapered seats and wedges of OIC copper nickel alloy. You'll find this new valve a money-saver on water, oil, gas, steam or any other service where bronze gate valves are used.

LONGER LIFE—LOWER COST

Scientifically designed, constructed of highest quality materials, accurately machined and thoroughly tested for trouble-free operation.

EASILY SERVICED—LOWER MAINTENANCE

Easy to dismantle and reassemble. Quick inspection and servicing. Easy repacking.

EASIER OPERATION—SAVES TIME

Perfect seating without binding or undue wear. Straight-through flow. Minimum pressure drop.

STRONGER—GREATER SAFETY

Ample wall thicknesses. No dangerous stress concentrations. Leak-proof joints.

OIC
PACE SETTER IN VALVES

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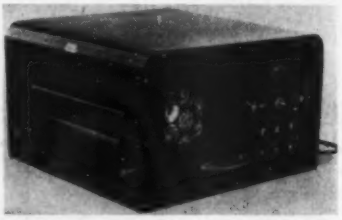
SPECIAL INTRODUCTORY OFFER

If you'd like to check this OIC bronze 200 lb. union bonnet gate valve, simply send us the size and we'll deliver you a sample on memo billing. Inspect it, analyze it, take it apart, test it. At the end of 30 days, if you're not convinced of its superiority over any comparable valve you've ever used, return it for full credit.

THE OHIO INJECTOR CO.
180 S. LYMAN ST. WADSWORTH, OHIO

BRONZE • IRON • CAST STEEL • FORGED STEEL

32 PORTABLE SEISMOGRAPH RECORD DUPLICATOR is a new development for duplications of seismograph records or similar charts and printed matter where a snow-white background is desired. Model uses Kodagraph Autopositive paper up to 10 in. wide. It is a contact printer of the continuous-belt drum type. Makes exceptionally good reproductions of seismograph records by the print-through method. Printer remains cool, no hot lights. *Paul A. Guenther.*



IT'S NEW CHECK IT

33 MEZURALL AND WIZARD, JR. steel tape rules now have chrome-clad nonglare satin-finish blades. These blades absorb disturbing light reflections and afford easier reading of all markings and graduations. The black markings stand out sharply against the hard, smooth chrome-white surface. They are durable, permanently bonded to the steel and sunk below the surface, protected against wear. Blades will not chip, crack, or peel, are rust resistant, and replaceable in a matter of seconds. The self-adjusting end hooks have a sliding action affording accurate butt-end and hooked-over measurements. *Lufkin Rule Co.*

IT'S NEW CHECK IT

34 RECTIFIER AND CONTROL ASSEMBLY offers all-weather corrosion prevention for piping systems buried in soil, submerged in liquid, or above ground. Features claimed by the designers include: fast, eight-step voltage adjustment without shutting down unit; high inherent inverse voltage protection, up to 36 volts; removable reenforced bug screens; and convection-cooled rectifier elements. Automatic high-temperature thermostatic cutout reduces output to half rated value during periods of excessive temperature. Normal conditions are restored when temperature drops. Recording meter terminals are provided for connecting recording meter into unit's d.c. circuit. *Control Corp.*

IT'S NEW CHECK IT

35 ILLUMINATED DIAL GAGE. The dial is lighted like automobile speedometers with black light that glows in the dark. This modern gage is made in a square case for flush mounting on a panel, and is symmetrical with other square-case instruments. The dials have a black background with ultraviolet phosphorescent pointer, numerals, and graduations. Plain white illumination may be supplied. It is made in standard 4½, 6, and 8½-in. dial sizes with the same drilling dimensions as conventional round-case gages. *Helicoid Gage Division American Chain & Cable Co., Inc.*

IT'S NEW CHECK IT

36 SUPER-SOCKETS. Self-tapping screw sockets with Carboloy inserts are for driving case-hardened, self-tapping screws with power tools of all types. They may also be used with hand drivers. The screw drive opening is formed of solid Carboloy which is permanently inserted into a hardened steel blank. Actual life is at least 10 times that of all-steel sockets. Sockets are now available in ¼-in. square drive with ¼ and 5/16 in. nominal hexagon openings. *J. H. Williams & Co.*

IT'S NEW CHECK IT

37 INSULATED ELECTRODE HOLDER designed around unusually small size, combines the advantages of both tong and hole-type holders in providing a strong, lock jaw, electrode grip, and easy thumb-pressure electrode release. The holder's small size is ideal for operation with heavy gloves and in corners and other confined areas. The tip of the jaw end of the holder is covered with a new, high-temperature resistant, asbestos-base compound which is highly flexible and will resist the abrasion of rubbing against metal as well as the wear caused by weld spatter. Weld spatter will not adhere to it. *Lincoln Electric Co.*

IT'S NEW CHECK IT

38 DRAIN MASTER. An automatic moisture eliminator with a device which automatically ejects moisture and oil from air-brake systems, air-line traps, and air compressors, protects and extends the life of valuable air brakes and industrial equipment. It is 2 in. high, weighs only 3½ oz. It operates on the buildup and relief of pressure, automatically ejecting all water and oil twice for each operation of the equipment. *Master Equipment Sales.*

IT'S NEW CHECK IT

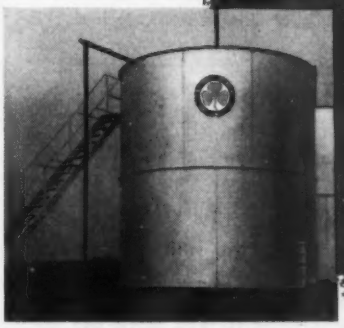
39 FLAT-BRAIDED WIRE-ROPE SLING. This sling was designed to provide a relatively wide, flat bearing surface with the sling thickness held to a minimum. Being made from an endless wire rope, the sling ends terminate in natural loops which are fitted with special crescent thimbles. It was designed for a particular lifting operation requiring a sling with a maximum body width and minimum thickness in addition to light weight and flexibility. The sling is used in a basket hitch with the sling encircling the load and the two loop eyes on the crane hook. It is made to order in the length and safe load capacity required. *Macwhyte Co.*

Pretesting

IN

MALONEY-CRAWFORD PLANT

ASSURES TIGHT FIT WITH COMPLETE INTERCHANGEABILITY OF PLATES IN THE FIELD . . .



Maloney-Crawford bolted steel tanks are made to rigid (beyond API requirement) Specifications. Yet, to make sure of perfection, Maloney-Crawford makes periodic shop inspection of the plates by actually constructing a tank in the plant, as shown above. Specify Maloney-Crawford for a strong, well made product.

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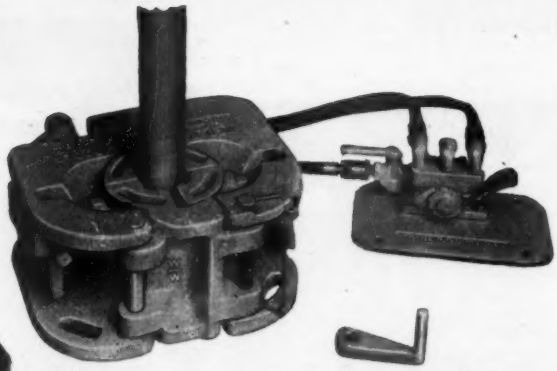
TEXAS PANHANDLE REPRESENTATIVE: Atlas Tank Company, Pampa, Texas

we're always uncorking something *new*



the Newest of the New

POWER TUBING SPIDER

Web Wilson is again first in the field—this time with a NEW Power Tubing Spider—so simple, safe, fast and efficient that it will save up to 30% of your round trip time on all tubing jobs.

- operates on air pressure ranging from 60 to 125 pounds.
- simple foot control can be operated from gang pushers position or anywhere on the floor.
- no danger of damage to spider from elevators or falling equipment.
- slips cannot be accidentally opened.
- slip inserts can be changed fast and easily.
- all four slips are synchronized to provide precision setting and release.
- send for complete information.

Field-Proven

WEB WILSON Oil Tools INC.

HUNTINGTON PARK, CALIF. • HOUSTON, TEXAS • NEW YORK CITY

Among the Drilling Contractors

Rotary-Rig Activity Rises; Total Ahead of Last Year

The total number of rotary rigs in operation in both the United States and western Canada increased during the week ended June 5 over the week of May 29.

At the close of the week there were a total of 2,178 rigs running in the United States, compared with 2,156 the week previous, and 75 operating in western Canada, compared with 69 a week ago.

The grand total, including both the United States and western Canada, was 2,253 rigs, compared to 2,225 the previous week, up 28.

ROTARY RIGS IN OPERATION*
(United States and Western Canada)

Area—	Week ended 6-5-50	Change week ended 5-29-50	Change week ended 6-6-49
Gulf Coast	496	—20	— 79
W. Tex.-N. M.	768	+17	+137
Ark.-N. La.-E. Tex.	142	+ 9	— 30
Oklahoma	278	+ 3	+ 49
Kansas	129	+ 3	— 2
Illinois-Eastern	146	— 2	+ 15
Rocky Mountain	89	+ 2	— 23
Pacific Coast	130	+10	— 61
Total U. S.	2,178	+22	+106
Western Canada	75	+ 6	— 11
Total	2,253	+28	+ 95

*Courtesy Hughes Tool Co.

The area in the United States making the sharpest gain was the West Texas-New Mexico region, which had a total of 768 rigs in operation. This is an increase of 17 over the week previous, and 137 over the same period a year ago.

Only two areas showed decreases: Gulf Coast, off 20, with 496, and Illinois-Eastern, off 2 with 146.

Total rigs in operation in the United States and western Canada at the end of the week reflected a gain of 95 over the corresponding week in 1949.

Safety Clinic Set

DALLAS.—Plans are being completed for the fifth annual drilling-industry safety clinic, sponsored by American Association of Oilwell Drilling Contractors, which will be held at the Baker Hotel here June 15-16. The program will be devoted to papers and discussions on safety in operations.

Drilling Firm Incorporated

AUSTIN.—A domestic charter has been issued to Tony-Lynn Drilling Co., Inc., Midland, Tex., with capital stock of $15,300. Incorporators are E. L. Durrell, Joan Durrell, and Walter G. Beardsley.

Zack Brooks Drilling Co. has contract for Continental Oil Co. et al. 1 Wideman, C NW SE 21-21n-7e, 2 miles west of Homer townsite, in Claiborne Parish, Louisiana. Contract calls for the Smackover lime or total depth of 7,000 ft.

Williams-Copeland, Inc., Tulsa, is drilling H. Waggoner & Co. 1 Krontil, SW SW SW 27-12n-6e, 1 mile east of Prague in Lincoln County, Oklahoma, a Prue sand test. The well, drilling at

On location in Scurry County, Texas, where Gray Wolfe Drilling Co., Houston, is drilling for Pan American Production Co. Left: L. A. Gregory, toolpusher, Gray Wolfe Drilling Co. Right, front row, left to right: S. A. Harris, Horace Hemenas, Charles H. McClendon (driller), W. C. Smith, J. B. Word, U. A. Armer, and C. E. Wilkerson. Back row, left to right: H. A. Freeman, B. W. Dawkins, and E. S. Hooker (driller). Except Dawkins, Pan American engineer, all are members of Gray Wolfe drilling crews.

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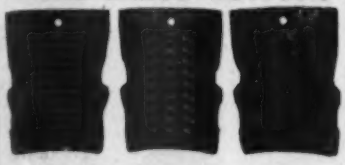

"Varco" buttons, popular for years in rotary drill pipe slips, proved satisfactory and have been adopted and are installed in segments of automatic casing spiders and elevators of various makes. Wickers are removed and holes bored for a maximum number of VARCO casing buttons, to assure uniform and maximum gripping area. Converting buttons for the next smaller casings are available. Write for complete descriptive data.

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P. O. Box 748, Odessa, Texas

2,625 ft. last week, is slated for total depth of 3,350 ft. It is midway between, and about ½ mile south of two recent discoveries.

Santa Fe Drilling Co., Santa Fe Springs, Calif., early in June was one of the busiest contractors on the West Coast, with nine rigs at work. Four rigs were contracted to Union Oil Co., one each in the Dominguez, Coalinga Nose, La Habra, and Orcutt fields. Two of the remaining rigs were drilling for Shell Oil Co., one in the Anaheim area of Orange County, and the other in the Alpaugh gas area of Kings County.

K. B. Knox Drilling Co., Houston, has assigned a rig to a location in the Willis field, Montgomery County, Texas Gulf Coast, where it will drill a well for its own account. Location of the test, 1 Calfee, is in the William Weir Survey. Production is expected around 3,800 ft.

Fleet Drilling Co. is drilling Sohio Petroleum Co. 1 Callie Blake, in NE NW NW 32-6s-2e, Love County, Oklahoma, and Sohio's 1 Neustadt, NE NW NE 32-6s-2e, in the same county. The Blake last week was below 2,310 ft., and the Neustadt was drilling at 3,027 ft. Both tests are in the Greenville pool.

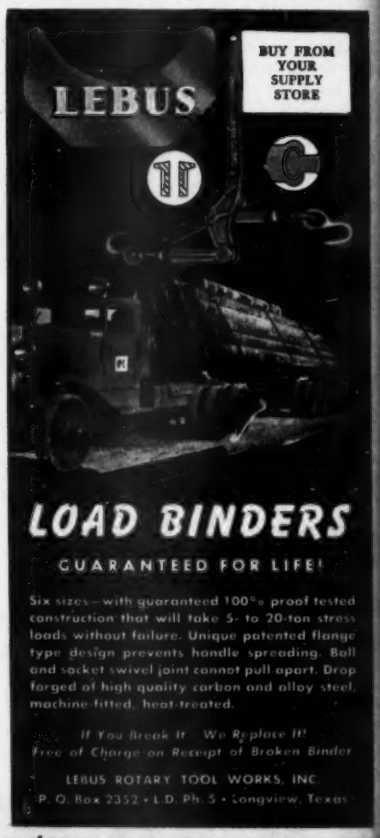
Big Chief Drilling Co.'s 1 DeLoache, wildcat in Labour 22, League 77, of Reeves CSL Survey, Hockley County, Texas, recovered 20 ft. of mud on a drill-stem test taken last week between 10,832-955 ft. Crew is now drilling ahead below 10,970 ft. In Colorado, **Big Chief Western** is drilling a 7,650-ft. test for Stanolind Oil & Gas Co. near Ignacio in La Plata County, in the southwestern part of the state. The wildcat, 1-B Ute Indian, is in C SE NE 18-33n-7w. At 2,440 ft. the well showed for an estimated 5,000,000 cu. ft. of gas daily last week. Crew is drilling ahead, with the Dakota series the objective. The lease lies northeast of the Barker Creek field and north of the Blanco Basin and Kutz Canyon gas areas, near the four-corners area of Colorado, Utah, New Mexico, and Arizona.

Mallard Drilling Co. has tools below 2,800 ft. at its 1 Lamatsch, NW NW NW 18-17-11, one of two new wildcat tests drilling near prospective pay levels in Barton County, Kansas. **Anschutz Drilling Co.** is making hole below 3,000 ft. at its 1 Batchman, SE SE SE 19-20, 2 miles southeast of the Sunny Valley pool.

Delta Drilling Co. and **Delta Gulf Drilling Co.** are drilling ahead below 4,582 ft. at 1 Sparks, in Section 161, Block 1, H&TC Survey, Stonewall County, Texas. Crew recovered 4,100 ft. of salt water on drill-stem test at 4,358-4,582 ft.

Steen Drilling Co., Houston, has contracted to drill another deep test for Gulf Refining Co. in the Edgerly field, Calcasieu Parish, Coastal Louisiana. The new well is 2-E Krause & Managran, located in 19-9s-11w. It will be carried to the Frio zone, expected around 9,500 ft.

Kirkwood & Co., Alice, Tex., has a rig running on a wildcat test located in Lot 8, Resubdivision of the Traylor Ranch, 2½ miles west of Bloomington, Victoria County, Lower Texas Gulf Coast. The test, 1 Rydolph-Smolik, is being drilled for R. S. Randerson and Alex W. Heard. Contracted depth is 7,000 ft.



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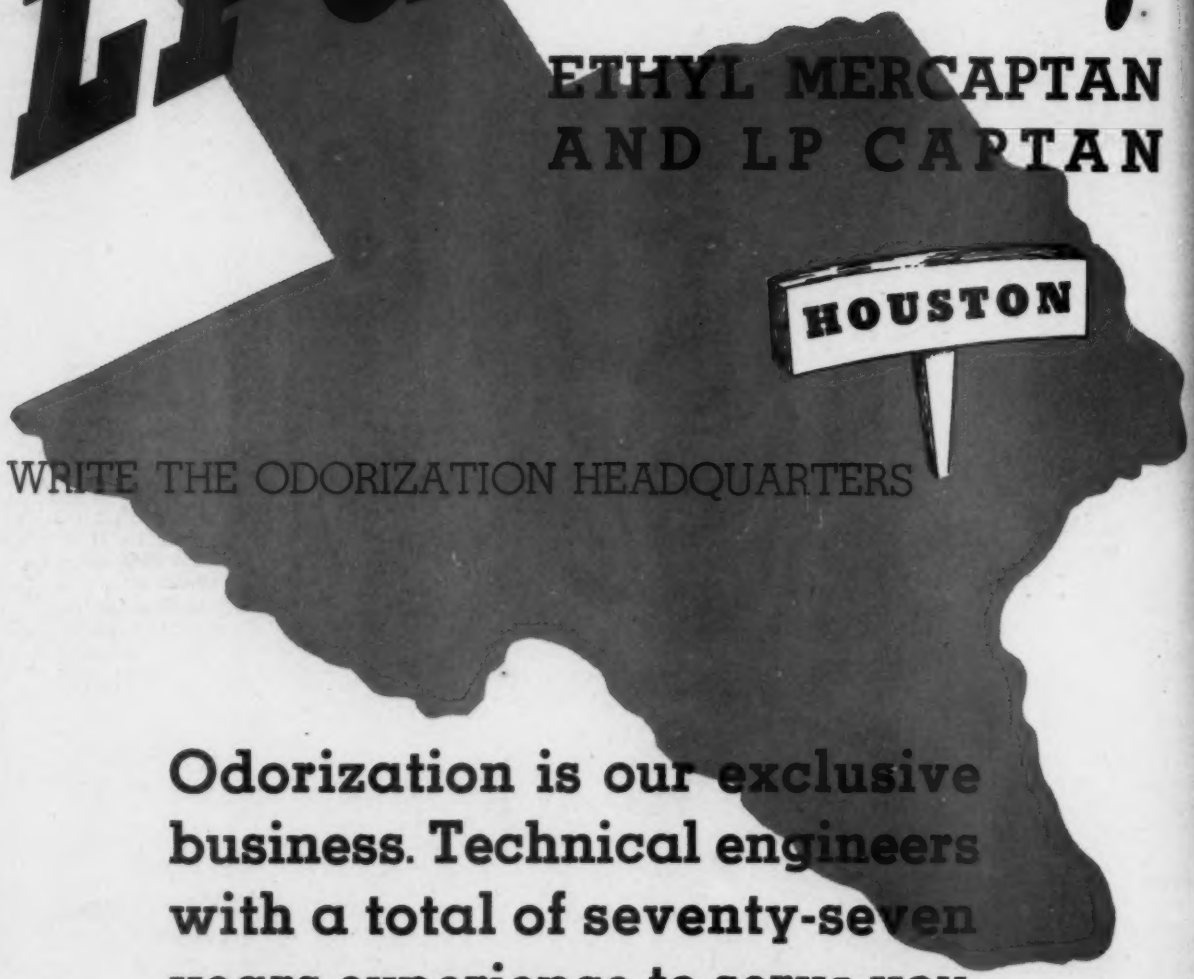

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Phillips Gas Case

Supreme Court rules on controversy of supply

WASHINGTON. — A decision was handed down by the United States Supreme Court last week in the controversy between Phillips Petroleum Co. and three other firms—Skelly Oil Co., Stanolind Oil & Gas Co., and Magnolia Petroleum Co.

The controversy concerned the right of the latter three companies to terminate certain contracts entered into with Phillips for a supply of natural gas to be resold to Michigan-Wisconsin Pipe Line Co.

In the majority opinion of the court, written by Justice Frankfurter, it was held that Phillips should not have brought its suit in federal court to compel Skelly and Stanolind to carry out the contracts, but should have sought relief in the state courts. It said that there was no adequate basis for Phillips seeking to invoke against the two firms the Federal Declaratory Judgment Act for a declaration that the contracts were still "in effect and binding upon parties thereto," since there was no diversity of citizenship.

The court ordered, in view of this, that, as to Skelly and Stanolind, the judgment of the District Court for the Northern District of Oklahoma, supporting the position of Phillips, which judgment was upheld by the Tenth Circuit Court of Appeals, be reversed, with directions that the case be dismissed. If Phillips is to continue the litigation, it must do so in the state court.

Contract terms. — The contract between Phillips and each of the three companies provided that in the event Michigan - Wisconsin Pipe Line Co. failed to secure a certificate for construction and operation of its pipe line, the company selling to Phillips should have the right to terminate the contract at any time after December 1, 1946. On November 30 of that year the Federal Power Commission ordered that the certificate be issued to Michigan-Wisconsin, subject to certain conditions that were not met until later. Since the actual content of the FPC order was not made public until December 2, 1946, each of the three potential suppliers gave Phillips proper notice of termination, contending that Michigan-Wisconsin had not received a certificate.

Magnolia's portion. — Justice Frankfurter pointed out that in the Magnolia portion of the case there is diversity of citizenship between it and Phillips. He said the Supreme Court had not been provided with sufficient information on which to rule in the matter and ordered that the judgment of the Court of Appeals be vacated and the case be remanded "in order that the Court of Appeals either itself or by sending the case back to the District Court can further explore, through ways that may be appropriate, the issues which have been laid here."

Lone Star Gets Loan

DALLAS.—Lone Star Gas Co. has borrowed $85,000,000 to clear its financial obligations for a 5-year expansion program. Prudential Insurance Co. of America and a group of 11 banks supplied the funds, according to D. A. Hulcy, Lone Star president.

The firm will use the money to retire its outstanding loans of $55,250,000, and to finance the $81,406,856 expansion program.

Prudential loaned $65,000,000 of the total, which is the sixth largest ever made by the company, and the largest single loan ever made by it to a public utility.

Lone Star will spend $45,596,380 on its transmission division, which includes exploration, development, and recovery plants, Hulcy said. The expansion program will be completed by 1956.

Court to Review Case

WASHINGTON.—A case involving legality of the 7-cent minimum wellhead price for the Guymon-Hugoton field set by the Oklahoma Corporation Commission will be reviewed by the United States Supreme Court.

Request for review by the court was filed by Phillips Petroleum Co., Cities Service Gas Co., and others, on appeal from the decision of the Oklahoma Supreme Court, which upheld the order.

The Oklahoma Commission's order is unconstitutional, the companies contend, because it constitutes an illegal taking of property.

Trunkline Opens Offices

HOUSTON. — The Trunkline Gas Supply Co., which plans to build a cross-country gas pipe line from South Texas to Illinois, has opened its main headquarters in this city.

The company has Federal Power Commission approval for a 1,219-mile 10-26-in. natural-gas line from McAllen, Tex., to Tuscola, Ill. It is 60 per cent owned by Panhandle Eastern Pipe Line Co. Hy Byrd, a Panhandle Eastern director, is head of the Houston office.

The Trunkline firm, together with Panhandle Eastern, will spend about $120,000,000 in transporting Texas gas to markets in the Midwest and Canada. The big-inch line, due to be completed in October 1951, will have a daily capacity of 250 million cubic feet.

Kansas-Nebraska Expansion

WASHINGTON.—Kansas-Nebraska Natural Gas Co., Phillipsburg, Kans., has asked the Federal Power Commission for authorization to expand the capacity of its pipe-line system in Kansas and Nebraska to approximately 146,000,000 cu. ft. of natural gas daily.

The new facilities would be used to meet increased demands of Kansas-Nebraska's present markets and to provide service to new markets in Nebraska, including the towns of Pleasanton, Arcadia, Ord, and Ravenna.

Estimated cost of the proposed construction is $729,331. The program includes installation of 1,640 hp. of additional capacity at existing compressor stations; and 4 miles of 2⅜-in. line from the company's Odessa-Loup City line to Pleasanton, Neb., with a town border station at Pleasanton for service to that community.

In addition, Kansas-Nebraska would replace 16 miles of 8⅝-in. pipe north and south of its Colby, Kans., compressor station with 12¾-in. pipe; replace 22 miles of 6⅝-in. pipe east and west of North Platte, Neb., with 8⅝-in. pipe; replace 8.6 miles of 4½-in. pipe in the Goodland, Kans., area with 6 miles of 8⅝-in. pipe and 2.6 miles of 6⅝-in. pipe; and loop 6 miles of 12¾-in. pipe line running southwest from its Palco, Kans., compressor station, with 12¾-in. pipe.

Natural Gasoline

Shell Completes New Plant

HOUSTON.—Shell Oil Co. has completed its new gasoline plant at Provident City, in Colorado County, Texas, 100 miles southwest of here, but the plant will not start operations for several months.

The delay is caused by a shortage of pipe needed by Texas Eastern Transmission Corp. to construct a 110-mile, 16-in. pipe line to carry gas from the plant to its pipe-line system.

Shell's new plant will process an average of 60,000,000 cu. ft. of gas daily, recovering approximately 2,500 bbl. of liquid products by high-pressure absorption. Approximately 50,000,000 cu. ft. daily of residue gas will be dehydrated and sold to Texas Eastern.

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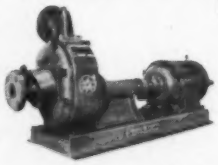
These efficient, high capacity pumps prime and reprime automatically. Positively self-cleaning; do not jam or clog. Extra heavy construction. Used to supply water, condition mud, dewater, transfer oil from tanks, circulate tank bottoms, salvage oil, wash down equipment, and do many more jobs. Engine driven: Sizes 1½ to 10 inches, 15 to 3500 GPM. Available base mounted, with steel wheels or rubber tired wheels. Electric motor driven: Sizes 1½ to 10 inches, 15 to 3300 GPM, 1/3 to 50 hp., close coupled or long coupled.

A typical Marlow Self-Priming Centrifugal engine driven model for portable applications.



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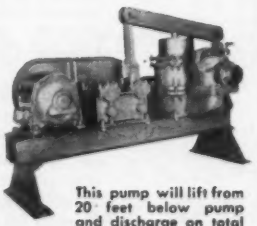
A Marlow "Mud Hog" Diaphragm Pump will take a trickle or full capacity at each stroke.

MARLOW WALKING BEAM PLUNGER PUMPS

The rugged Marlow walking Plunger Pump is fitted with metal plunger instead of diaphragm. With same basic features as the diaphragm pump, well suited to indefinitely sustained pumping for removing heavy sludge, residues, recirculation, for tank bottom disposal and other heavy jobs. Sizes 3- and 4-inch single; 60 to 90 GPM. Gasoline engine or electric driven, portable or stationary mounting.



This pump will lift from 20 feet below pump and discharge on total heads of up to 80 feet.

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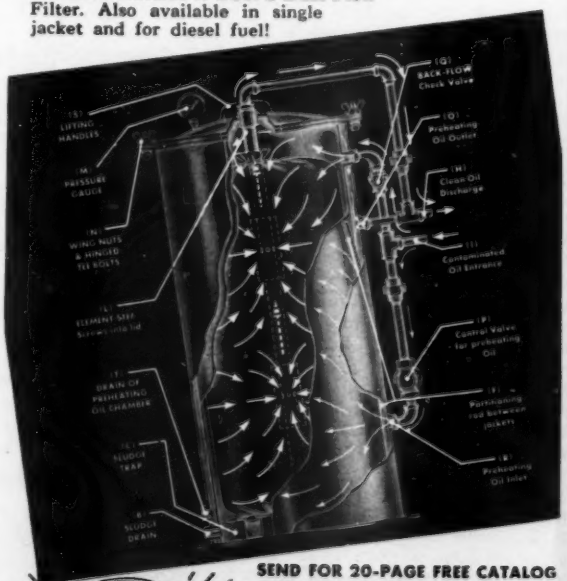
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REFINING

Dow Expands

Chemical firm to expand $30,000,000 at Freeport

Leigh S. McCaslin, Jr.

HOUSTON.—Dow Chemical Co. will begin a $30,000,000 plant-expansion program July 1 at its $100,000,000 existing installation at nearby Freeport.

This announcement was made last week when directors of the concern met at the company's Freeport office. Leland I. Doan, president, said that substantial increases will be made in the production facilities of the power, ethylene, chlorine, styrene, glycol, vinyl chloride, and vinylidene chloride plants.

The vinyl chloride and vinylidene chloride plants manufacture the essential materials used in Dow's plastic which is sold under the trade name of Saran. Increased sales demand for plastics has made higher production necessary, company officials stated. Increased sales are also responsible for the expansion of the glycol and ethylene oxide facilities. The chlorine and ethylene plants provide the essential raw materials for the other plants.

Engineering and design work for the new units is now in progress. It is expected that construction work will start in the near future.

Two plants.—Dow has two plants—Plant A and Plant B—at its Freeport location. Construction on Plant A was begun in 1940 and first production began in early 1941. In July of 1940 construction of the Ethyl-Dow Chemical Co. plant adjacent to Plant A was begun. This plant, owned jointly by Dow and the Ethyl Corp., extracts bromine from sea water. Bromine is one of the essentials in the manufacture of ethyl fluid for high-test gasolines.

In early 1942 construction was begun on Plant B, then known as the Dow Magnesium Corp., a plant owned by the Defense Plant Corp. of the federal Government. This was a plant designed for the large-scale production of magnesium for use in the war effort. The first magnesium was produced in this plant on June 26, 1942.

After the war, excepting certain parts of this plant which were retained on a stand-by basis by the Government, Dow Chemical Co. bought it and the adjoining styrene plant. The styrene plant was built for the Government in 1943 as a part of its synthetic-rubber program.

In addition to magnesium, bromide, and styrene, the company produces chlorine and hydrogen. An ammonia plant is currently under construction. Raw materials used include natural gas, sea water, oyster shells, and common salt.

Work Ahead of Schedule

CLEVELAND.—Construction is 3 months ahead of schedule on a $4,000,000 expansion and modernization of catalytic cracking facilities at the Standard Oil Co. (Ohio) refinery in Cleveland. Work is expected to be completed by November.

The cat cracker, with a capacity of 18,000 bbl. of feed stock per day, is being erected by Bechtel Corp. and will be the highest industrial structure in Cleveland. Gasoline capacity of the expanded unit will be 50 per cent greater than the old cracking unit.

The Cleveland refinery expansion is part of a 3-year, $100,000,000 capital investment program by Sohio.

Navy Fuel Contracts Let

WASHINGTON.—The Navy Department last week announced the letting of contracts for 7,940,000 bbl. of Navy special fuel oil, 600,000 bbl. of diesel oil, and 120,000 bbl. of aviation gasoline at an over-all cost of close to $14,683,000.

Contracts for fuel oil went to Esso Export Corp., New York, for 3,620,000 bbl. at a cost of $6,226,400; Union Oil Co. of California, Los Angeles, 1,620,000 bbl. for $2,224,200; General Petroleum Corp., Los Angeles, 1,500,000 bbl. for $2,113,500; Hancock Oil Co. of Cal., Long Beach, 750,000 bbl. for $1,066,000; and Sinclair Refining Co., New York, 450,000 bbl. for $783,000.

The diesel-oil purchase was split between General Petroleum Corp. and Tide Water Associated Oil Co., San Francisco. Each will supply 300,000 bbl., General at a price of $882,000, and Tide Water for $969,000.

The contract for 120,000 bbl. of aviation fuel went to the Richfield Oil Corp., Los Angeles, at $417,816.

Benzene Price Differential

The price differential between coal and petroleum-derived benzene was further reduced recently by an increase in the price of the coal by-product, from 22 to 25 cents per gallon, at Pittsburgh. This brings the price in the Gulf Coast to about 28 cents per gallon, as compared with nearly 40 cents for the petroleum-derived product.

The advance will have little effect on the Pan American Refining Corp.'s operation at Texas City, as benzene

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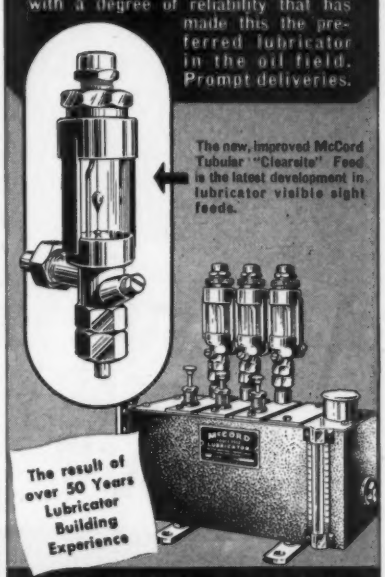
The McCord "SF" Lubricator provides close and accurate feed adjustments with a degree of reliability that has made this the preferred lubricator in the oil field. Prompt deliveries.

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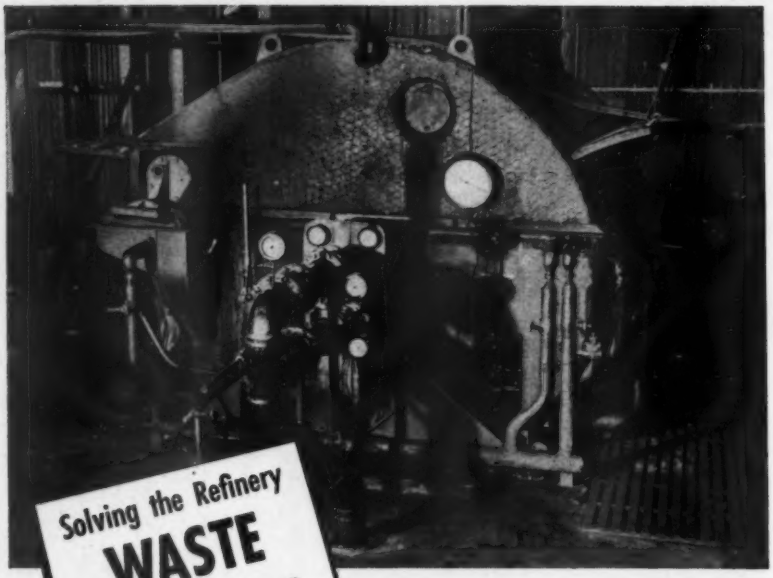

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Trap residues—separator box emulsions—sludges . . . the Oliver Precoat Filter can effectively handle these wastes by dewatering sludges and breaking oil-water emulsions, resulting in stocks for refinery re-run and water ready for disposal in public streams. For example, a refinery is obtaining an oil phase carrying only 2/10 of 1% sludge and only a trace of water; the water phase is comparatively oil-free.

Oliver United engineers, calling on their 42 years of filtration experience and their many varieties of filter types, developed this closed type, continuous vacuum precoat filter for handling refinery wastes. It's proving a boon to refineries in connection with this vexing problem.

A letter or phone call to our nearest office will have a skilled refinery filtration engineer at your plant whenever desired to make a study and recommendations for a filtration plant to handle the wastes properly.

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Another very profitable use of the Oliver Precoat Filter in refineries is in connection with contact clay handling. Many are in service providing continuous handling, great reduction in oil losses over other methods, and more easily handled cake.

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production has been maintained at the highest possible level due to a strong local demand. The plant, utilizing a hydroforming unit, is capable of producing from 3 to 5 million gallons yearly, and operation is projected to close to the maximum figure. *(The Oil and Gas Journal, April 13, 1950, page 60.)*

Chemical sources estimate that benzene production this year will fall about 15 million gallons short of demand in this country. Although the petroleum product must sell at nearly 40 cents per gallon, increasing demand from the chemical industry and decreasing supply from the coal industry combine to present a firm market for all the benzene that Pan American can synthesize.

W.P.R.A. Annual Meeting

TULSA.—The 1951 annual meeting of the Western Petroleum Refiners Association will be held at the Plaza Hotel in San Antonio April 2-4.

Final plans for the annual sessions will be announced later, according to John Day, manager of the association.

New Platforming Unit

Bell Oil & Gas Co. is now constructing a Universal Oil Products platforming unit at its Grandfield, Okla., refinery.

J. A. Anson, Tulsa, said that the unit, with nominal capacity rating of 1,500 bbl. daily, is expected to be completed in December. It is the first platforming unit announced for construction by a refinery in the Mid-Continent area. First installation of its kind was at Old Dutch Refining Co.'s plant at Muskeegon, Mich.

Lube Production Rises

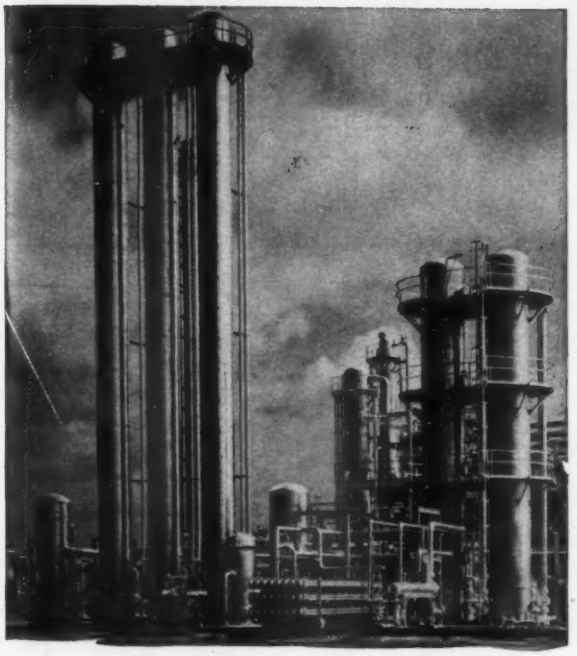
TULSA.—Production of lubricating oils in the Mid-Continent region increased 21.6 per cent in April compared with April 1949, Western Petroleum Refiners Association reported last week. Shipments also showed a substantial increase.

Taken from a report of activities of 14 companies, the figures compare with the activities of 13 reporting companies last year.

Total production amounted to 1,414,538 bbl., an increase of 252,130 bbl. Shipments totaled 1,425,080 bbl., up 17.1 per cent or 208,276 bbl. over April last year.

Domestic shipments gained 228,022 bbl., up 19.6 per cent to a total of 1,390,874 bbl. Exports, however, dropped 36.5 per cent, or 19,746 bbl. to 34,206 bbl.

Stocks on hand at the end of April totaled 1,663,954 bbl., a decrease of 4.3 per cent or 75,463 bbl. from the same month last year.



Southwest Gas Producing Co.—Uses

FLORITE

The recently completed gasoline plant of Southwest Gas Producing Company at Dubach, La., gathers wet gas from the surrounding area and employs new highly efficient methods for separating its ethane and propane components. Ninety million cubic feet of natural gas is handled daily, yielding a daily output of 230,000 gallons of liquefied hydrocarbons. The Fish Engineering Corporation of Houston designed and constructed this model plant.

In the two towers at the right of our illustration, wet gas is dehydrated with Florite and then passed to the three towers at the left for high-pressure absorption.

Floridin Products, adapted to a wide range of advanced industrial and technical uses, include several specially prepared forms of . . . . . .

FULLERS EARTH

as well as two grades of Florite, which is a . . . .

BAUXITE-BASED ADSORBENT

Your inquiry will be given careful attention.

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- ✓ Ignition Cut-Outs on Oil Pressure and Water Pump
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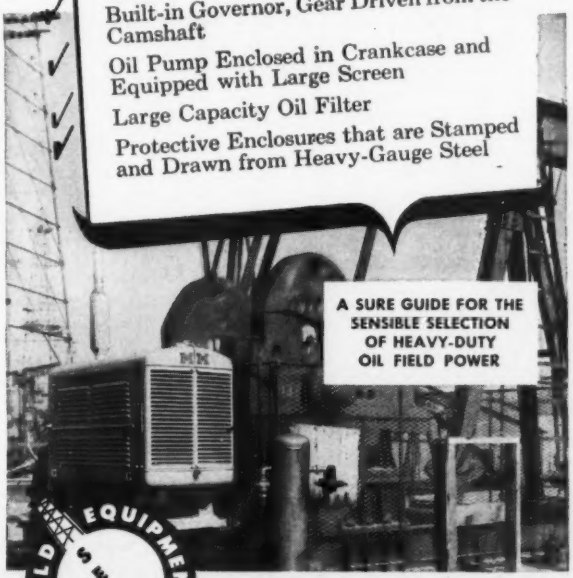
- ✓ Rigid Cast Front and Rear Legs That Are Bolted to Crankcase
- ✓ Large Twin-Disc Over-Center Type Clutch
- ✓ Heavy-Duty Power Take-Off with High-Grade Anti-Friction Pilot Bearings
- ✓ Extra-Large Capacity Radiator with Lead-Coated Core and Cast Tanks
- ✓ Fan Mounted on Timken Bearings
- ✓ Gear-Driven Water Pump with Bronze Impeller and Improved Seal
- ✓ Built-in Governor, Gear Driven from the Camshaft
- ✓ Oil Pump Enclosed in Crankcase and Equipped with Large Screen
- ✓ Large Capacity Oil Filter
- ✓ Protective Enclosures that are Stamped and Drawn from Heavy-Gauge Steel



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HOUSTON • TULSA

mfg. by: **UNIT RIG & EQUIPMENT COMPANY**
TULSA

SPECIFICATIONS

CAPACITY:
Depth of cut, 8' 6". Cutting widths from 32" to 52".

GENERAL DIMENSIONS:
Overall width, 10' 5½"
Height from G/L, 13' 4½"
Traveling length, 48' 8"
Width over crawler, 10' 5½"

CRAWLERS:
Caterpillar D7's, 24" wide

POWER UNIT:
Caterpillar D13000,
H.P. 110 @ 850 R.P.M.

FRONT WHEEL:
Steered hydraulically by hydraulic motor with worm and worm gear enclosed, running in oil.

EXCAVATOR WHEEL HOIST:
Front and rear excavator wheel hoist as well as conveyor hoist hydraulically driven enclosed in single case, running in oil.

EXCAVATING WHEEL:
Rim stock 1" x 9", 10' 3" I.D.

SEGMENT GEARING:
American Manganese Steel. Normal Speed of digging wheel at rooter points, approximately 248' per minute.

CONVEYOR:
Removable sections for narrow or wide buckets. Width of belt, 36". All inner and outer belt pulleys anti-friction bearings. New type silent center belt guides. Conveyor driven independent of digging wheel by hydraulic motor allowing any variable speed of conveyor belt.

ROAD SPEED:
Approximately two miles per hour.

WEIGHT OF COMPLETE MACHINE:
Approximately 74,000 lbs.

Pictured is No. 1 BIG INCHER, delivered April 15, to Eastern Construction Company at Lexington, Tennessee.

C-R-C and Unit Rig — your assurance of a ditching machine engineered and manufactured by men who know what's required in this tough job. This machine is operating beyond expectations. The specifications of the BIG INCHER indicate the ruggedness necessary for continuous low cost operation.

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HOUSTON, TEXAS — TULSA, OKLAHOMA

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PIPE LINES

Joint Venture

Price-Morrison to build loops for Tennessee Gas

BARTLESVILLE, Okla.—A joint venture has been undertaken by Price Constructors, Inc., here and Morrison Construction Co., Inc., Austin, to construct 174 miles of 30-in. loop lines for Tennessee Gas Transmission Co. The two will do business under the name of Price-Morrison.

H. C. Price Co. said that Price Constructors, a recently organized corporation, is sponsor of the joint venture. James P. Neill is president; C. S. LeNoir vice president; and E. L. Gallery, secretary-treasurer. Morrison Construction is headed by E. G. Morrison, president, and John W. Foster, secretary.

Price - Morrison has established headquarters in the Lockhart Building in Austin, with Foster serving as office manager.

The additional loop lines which are to be built for Tennessee Gas are located in western Tennessee and Kentucky. They form a portion of the third complete line linking the natural-gas-producing area of the south with the eastern consumer region supplied by the firm.

Along with the new extension of T.G.T.'s line to Buffalo, and additional compressor facilities planned for 1950, this back-looping will raise the system's daily capacity to 1,060,000,000 cu. ft.

Two spreads of equipment are laying lines for Price-Morrison. One spread started right-of-way clearance the middle of May. R. L. McMillon is superintendent, and E. J. Price is office manager. This spread will be located at Scottsville, Ky.

A second spread, with headquarters at Dickson, Tenn., began operations the first of June. Jack Hodges is superintendent and Glen Goyne is office manager.

McMillon's spread will initially lay a 28-mile stretch from Scottsville, Ky., to White House, Tenn. As soon as this portion of the line is completed, the spread will lay a 47-mile strip between Glasgow, and Lebannon, Ky. Hodges' spread will lay 99 miles of line from a point near Dickson, to Selmer, Tenn. The two spreads will be under the general supervision of C. S. LeNoir, and they are scheduled to complete the Kentucky-Tennessee loops by early fall.

Transcontinental Sues

NEW YORK.—Transcontinental Gas Pipe Line Corp. filed suit in federal court last week to enjoin city officials of Milltown, N. J., from interfering with construction of the company's pipe line.

Earlier, the town's police chief halted a contractor's ditching crew as it started work through the borough. This came after the town council refused the company permission to cross under city streets.

The opposition to the pipe line in this New Jersey community apparently arose out of rumors and exaggerated stories that have recently circulated as to the possibility of explosions in the line. It also reflects the fact that natural-gas transmission lines are relatively new in this section of the country.

Some weeks ago testing operations on another existing pipe line running through New Jersey resulted in some breaks. Prominent publicity was given to this development and to the fears of residents near the line.

In Milltown, several hundred residents signed a petition opposing construction of the line in the city limits. In a statement announcing filing of the suit, Transcontinental vice president Curtis Morris, said that only Milltown officials have refused the permits, though they were identical with the ones granted by other New Jersey cities and towns.

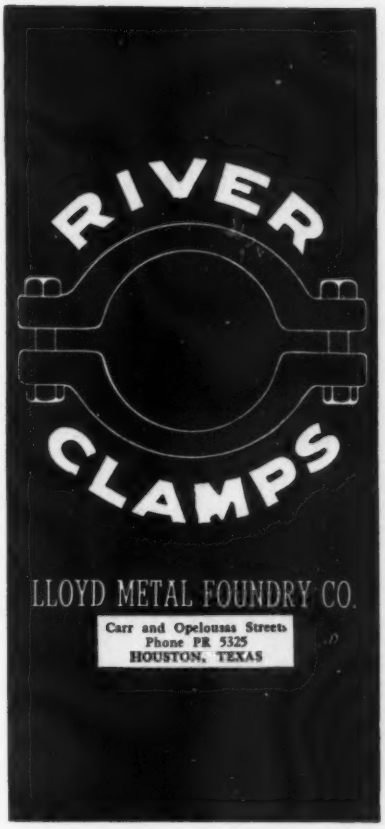
He said that every safety precaution had been taken, that highway officials from Texas to New York had approved Transcontinental's highway crossings, and that the company was under obligation to the public in the Northeast and to the Federal Power Commission to complete the line and begin deliveries by next December 1. To make doubly sure of the line's safety in the heavily populated area of New Jersey, Transcontinental has provided more than twice the safety factor that is standard pipe-line practice, Morris said. In Milltown, it is planned to use the existing industrial right-of-way of the New Jersey Public Service Co.

River Crossings Planned

Texas Gas Transmission Corp. has announced plans to make two new 20-in. submarine crossings of the Mississippi River in the Greenville, Miss., area.

The company has asked the Federal Power Commission for emergency authorization for the project so that construction can begin promptly and be completed by November 1. Cost is estimated at $1,460,000.

The company said that equipment recently developed is capable of moving 50,000 cu. yd. of mud per day from the river bottom and that two 20-ft. trenches would be dredged for



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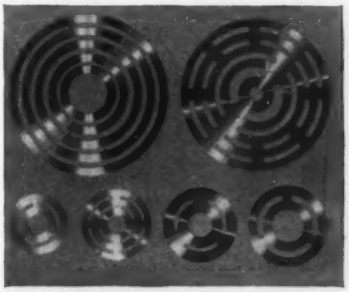

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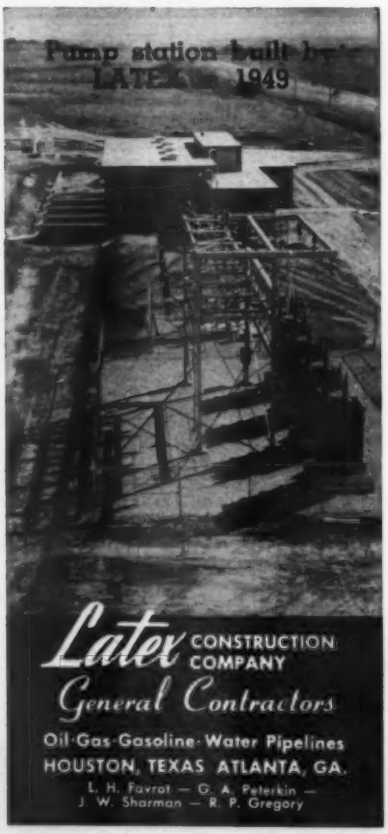

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General Contractors
Oil-Gas-Gasoline-Water Pipelines
HOUSTON, TEXAS ATLANTA, GA.
L. H. Favrot — G. A. Peterkin —
J. W. Sharman — R. P. Gregory

the crossings, in spite of the river's excessive depth and swift current at this point.

The trenches will be carried back a considerable distance into each bank of the river to provide against failures due to bank caving and scouring of the river bottom. Pipe and other materials for the project are either on hand or have been ordered.

In its application to the commission, the company said the proposed submarine lines would take the place of a 10-in. line installed in 1928 and two 12-in. lines, and one 16-in. line installed since that time. These lines are not now in service.

Texas Gas announced last week that later on this year it expected to build approximately 33 miles of 12-in. line from Slaughters, Ky., to Evansville, Ind. This will include two 12-in lines across the Ohio River.

Gathering Lines Bought

TULSA.—Bell Oil & Gas Co. announced here last week that its wholly owned subsidiary, Ben Franklin Refining Co. of Ardmore, Okla., has purchased 30 miles of gathering lines from Interstate Pipe Line Co. Included are Interstate's Graham, Milroy, and Oil City systems in Carter County, Oklahoma.

Ben Franklin will lay a trunk line to connect with its 6-in. main line, but pending its construction, Interstate will operate the gathering system under a lease agreement.

The Franklin firm has recently been adding to its system, and it is now handling over 500 bbl. daily in trucks, which its present pipe-line facilities cannot handle.

80-Mile Line Contracted

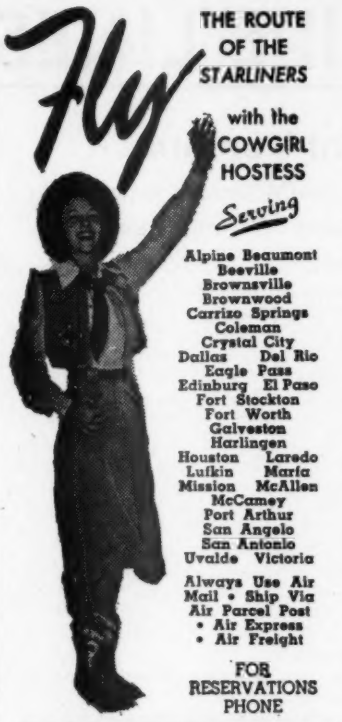
HOUSTON.—Ira O. Walker, president, Pan American Pipe Line Co., has announced the award of a contract for constructing a pump station and 80 miles of 10¾-in. trunk line running south from Scurry County through Mitchell, Sterling, Tom Green, and Irion counties, West Texas.

Brown & Root, Houston, received the contract. The pump station will be an 800-hp. unit and is to be constructed north of Colorado City, Tex.

New Compressor Station

DALLAS.—Lone Star Gas Co. is constructing a new compressor station 2½ miles west of Abilene, Tex., at a cost in excess of $100,000. Gas will be delivered to the station through a 10-in. line.

The plant will house two 330-hp. compressors, each self-contained. The station will increase deliveries of natural gas in the 10-in. line west of Abilene, as well as to boost pressure east toward the town if necessary, according to T. J. Shrabanek.



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CHASE, KANSAS — Call 22

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GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug fitting large removable top, handy non-leaking push button faucet. GOTT Water Cans for handy field use. Your Supply Store has them, get one today!

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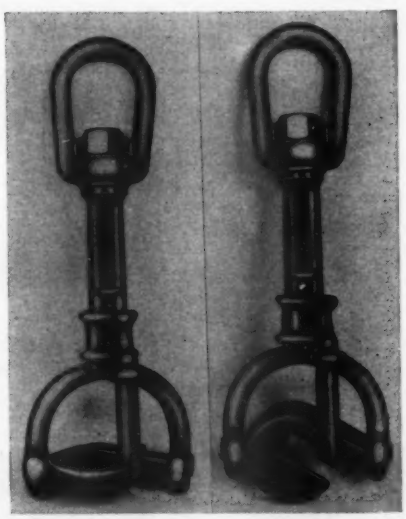

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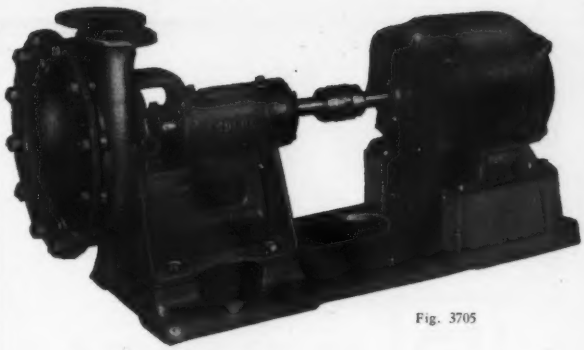

Fig. 3705

FOR OUTSTANDING SERVICE HANDLING CORROSIVE LIQUIDS—

Goulds new stainless steel centrifugals

ADVANCED PUMP DESIGN —

The Goulds 3705 stainless line represents the last word in effective design. Fig. 3705 pumps will give you efficient, dependable, 24-hour service in handling corrosive liquids—at low cost.

CAPACITIES —

Goulds stainless steel centrifugals are made in 8 sizes with capacities to 750 G.P.M. and heads to 180 ft. depending upon capacity.

ADVANTAGES —

Exceptional efficiency (see Bulletin for performance curves) plus extreme simplicity make this an ideal pump for corrosive applications. Higher interchangeability of parts cuts stocking problem. Quick inspection or cleaning—simply remove casing cover without disturbing pipe connections.

MEMBER HYDRAULIC INSTITUTE U.S.A.

Write for Bulletin 725.3 for complete details on this new stainless steel pump.

Goulds PUMPS INC.
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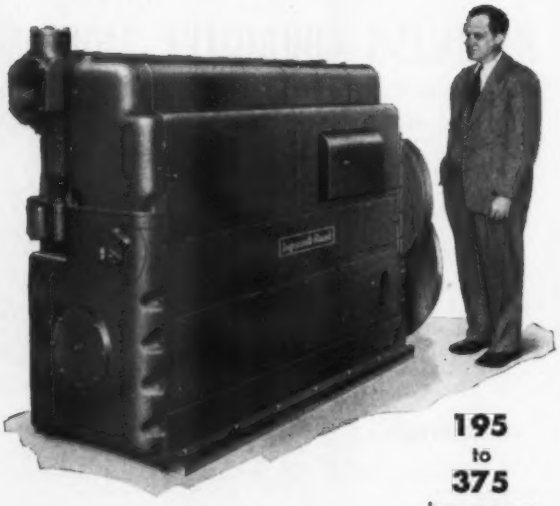

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Here's the smaller, lighter, more efficient, 4-cycle, supercharged heavy-duty diesel you've been waiting for . . . the TS engine. It's portable . . . but not automotive. Weighs only 30 lb per hp . . . yet operates at 900 to 1000 rpm. Consumes only 0.40 lb of fuel per hp-hr . . . yet has small, 7" by 8½" cylinders. Perfect balance . . . but no balancing devices.

Compare the new Ingersoll-Rand TS with any other diesel for size, economy; and performance—and you'll agree it is the greatest advance in engine design in the past decade. Ideal for cranes, shovels, derricks, pumps, generators, and all types of stationary and portable applications. Send for complete information today.

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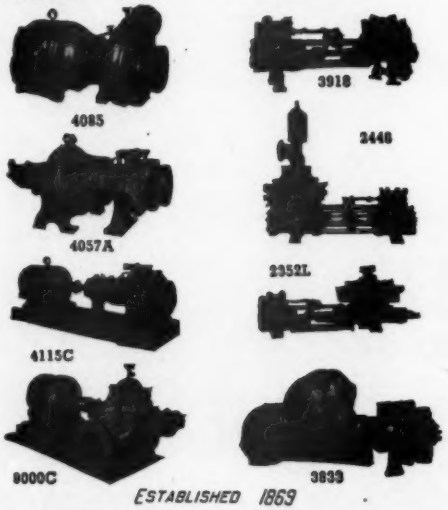

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Pipe-Line Construction

FOLLOWING is a tabulation of domestic pipe-line projects which are planned or under construction. Included are crude-oil, products, and natural-gas lines. The list was compiled from surveys made by The Oil and Gas Journal.

Crude-Oil Pipe Lines

Humble Pipe Line Co.—371 miles, 18-in., under way, West Texas-Satsuma Station to Baytown, Tex.; 178-mile western section contracted to Morrison Construction Co.

Lakehead Pipe Line Co.—320 miles, 18-in., Neche, N. D., to Superior, Wis.; Anderson Brothers Corp., contractor. K. B. Killingsworth, Pembina, N. D., Earl Saulsman, Clearbrook, Minn., and J. D. Jackquemine, Bemidji, Minn., spreadmen. Under construction.

Magnolia Petroleum Co.—60 miles 4-24-in. gathering system in La Ward and Lolita fields, Texas; Henry L. Lemons & Co., contractor; W. A. Remington in charge.

Mid-Valley Pipe Line Co. (Sun and Sohio)—1,000 miles, 20-22-in., under way, Longview, Tex., to Mayersville, Miss.-Covington, Ky., to Lima, Ohio. Contracts let for 857 miles as follows: Section 2, Haynesville, La., to Mayersville, Miss., completed. Section 3-A Mayersville to Oakland, Miss., Associated Pipe Line Contractors, Inc.; J. A. Williams and L. H. Gray, spreadmen; field office, Charleston, Miss.; Section 3-B 4-A, Oakland, Miss., to Henderson, Tenn., Houston Contracting Co., E. C. Norris, superintendent; field office, Batesville, Miss.; Section 4-B, 5-A, Henderson to Clarksville, Tenn., Eastern Construction Co.; work started April 1; to be completed by September 1, 1950. Louie Stewart and Cliff Simmons, spreadmen; field offices, Clarksville and Lexington, Tenn. Section 5-B, 6-A, Clarksville, Tenn., to Elizabethtown, Ky., field office, Clarksville, Fred L. Byers, superintendent; Britton Construction Co.; Section 6-B, 111 miles of 22-in., Elizabethtown to Hebron, Ky., H. L. Gentry Construction Co., Frank Morris and Jim Mitchell, spreadmen; field office, Warsaw, Ky., Section 7 South, Hebron, Ky., to Eaton, Ohio, Britton Construction Co., field office, Hamilton, Ohio; spreadman, Fred Peters; Section 7 North, Eaton to Lima, Ohio; Section 8, Magnolia, Ark., to Haynesville, La. Longview, Tex.-Haynesville, La., section, 110 miles 20-in., contracted to O. R. Burden Construction Co.; G. A. Lewis, spreadman; office, Marshall, Tex.

Cumberland and Tennessee rivers, Eastern Construction Co.; field office, Clarksville, Tenn., Fred L. Byers, spreadman.

41 miles, 20-in., Haynesville, La., to Red River near Benton La.; Latex Construction Co., contractor; H. L. Leake, superintendent; headquarters, Cotton Valley, La. W. A. Briley, assistant superintendent; Sam B. Harrison, office manager.

Naph-Sol Refining Co.—25 miles 6-in., under construction, Kimball Lake oil field, Newaygo County, Michigan, to refinery at Muskegon; Young Construction Co., Olney, Ill., contractor.

Pan American Pipe Line Co.—80 miles, 10-in., southern part of Scurry County, Texas, to connect with Humble Pipe Line Co.'s system near San Angelo, Tex. Work to begin in May. (Contract not let.)

Pelican Oil Co.—60 miles, 6-in., Lake Charles, La., area; Anderson Brothers Corp., contractor; field office, De Quincy, La.; R. W. Jernigan, spreadman. Under construction.

Phillips Petroleum Co.—45 miles 2-24-in., gathering system near Andrews, Tex.; Vaughn & Taylor Construction Co., contractor; Jess Moore in charge.

281 miles 10-in., planned, Borger, Tex., to Yale, Okla.

Pasotex Pipe Line Co.—32 miles 4-8-in., authorized, North Snyder, Tex., lines for gathering, delivery to Basin System.

Portland Pipe Line Co., Montreal Pipe Line Co., Ltd.—236 miles, 18-in., planned, Portland, Me., to Montreal, Que., Canada, contracted as follows: Oklahoma Contracting Co., 85 miles in Section 1 at southern end; Portland, Me., to Gorham, N. H.; H. A. Wylie, superintendent; Lisle W. Chambers, paymaster; office, Barton, Vt.; work starts June 1. Associated Pipeline Contractors, Inc.; L. H. Gray, spreadman. Section 2, 81 miles; and Fred Mannix Co., Ltd., 68 miles, Section 3, in Canada.

Richfield Oil Corp.—40 miles, 10-in., Cuyama Valley-Newhall, Calif., planned. 60 miles, 14-in., applying field joints, Newhall-Wilmington, Calif., under way.

Stanolind Pipe Line Co.—36 miles, in Kent County, Texas, outlet for Scurry County crude.

Texas-Empire Pipe Line Co.—42 miles, 16-in., authorized, Wilmington, Ill., to East Chicago, Ind.; O. E. Burden Construction Co., contractor; Pete Hiner, spreadman; office, Wilmington, Ill.

Texas Pipe Line Co.—42 miles 12¾-in., Patoka, Ill., to Clay City, Ill.; L. R. Young Construction Co., contractor; field office, Flora, Ill.: Whity Ralph, spreadman.

Texas-New Mexico Pipe Line Co.—37 miles, 10-in., proposed, Scurry County, Texas.

Products Pipe Lines

Great Lakes Pipe Line Co.—261 miles, 12-in., under way; contracted as follows: 52 miles, 15-in., Albert Lea to Fairbault, Minn.; under construction; Sheehan Pipe Line Construction Co., contractor; field office, Albert Lea, Minn.; C. W. Henderson, spreadman. 50 miles 12-in., St. Paul to Fairbault, Minn.; J. W. Brown, spreadman; office, Northfield, Minn. 50 miles 12-in., State Line to Fairbault, Minn., C. M. Brown, spreadman; office, Albert Lea, Minn. O. R. Burden Construction Co., 64 miles north from Des Moines; field office, Nevada, Iowa; G. D. Lewis, spreadman; A. C. Holder Construction Co., 72 miles to Iowa-Minnesota state line; Williams Brothers Corp., 20 miles, Mississippi River crossing and line to terminal and station. Kansas and Missouri river crossings, R. H. Fulton & Co.; field office, Kansas City; Ed Veach, spreadman.

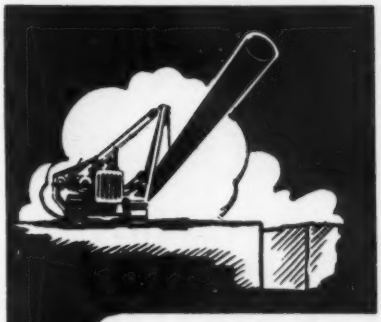
Second 12-in. line to be constructed between Barnsdall, Okla., and Kansas City, Kans., paralleling the 12-in. recently completed, and three existing 8-in. lines. Work to start as soon as pipe is delivered.

47 miles, 12-in., Atchison, Kans.,-Fall City, Neb.; Midwestern Constructors, Inc., contractor; field office, Falls City. This firm has following contracts, also: 47 miles, 12-in., Falls City to Nebraska City; field office, Nebraska City; and 48 miles, 12-in., Nebraska City to Omaha; field office, Plattsmouth, Neb.

290 miles, 12-in., Tulsa to Kansas City, Mo. Contracted as follows: 54 miles, Ponca City to Barnsdall, Okla., O. R. Burden Construction Co.; and 236 miles, Barnsdall, Okla.-Kansas City, Mo., Pacific Pipe Line & Engineers, Ltd. James Howe, superintendent for Pacific Pipe Line portion is headquartered at Chanute, Kans.; spread office at Tulsa with Ham Hamilton general spreadman and river-crossing spreadman; spread office at Dewey, Okla., Loue Robertson, spreadman; and spread office at Paola, Kans., Larry Webb, spreadman.

355 miles, 12-in., authorized, Kansas City through Omaha and Sioux City, Iowa, to Sioux Falls, S. D.

189 miles, 12-in., authorized, Kansas City to Des Moines, contracted as follows: 36 miles 12-in., Kansas City, Mo., northward



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Department "O"
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through Platte, Neb.; Trojan Construction Co., contractor; field office, Parkville, Mo.; Swede Tillotson, spreadman; 37½ miles, 12-in. Clay, Clinton, DeKalb, and Daviess counties, Missouri; Trojan Construction Co., contractor; field office, Cameron, Mo.; Felix Johnson, spreadman; Brodie Construction Co., 37-mile middle section; field office, Bethany, Mo.; A. T. Rathjen, spreadman; R. H. Fulton & Co., two 38-mile northern sections, Osceola to Des Moines, Iowa; Jerry Nash, spreadman; office, Osceola.

46 miles, 8-in., authorized, Cushing-Drumright-Tulsa, Okla.; Trojan Construction Co., contractor; field office, Sapulpa, Okla.; Slim Deaver, spreadman.

Phillips Petroleum Co.—155 miles 6-in., extension to present 200-mile line from Phillips, Tex., to LaJunta, Colo., on to Denver.

Standard Oil Co. (Ohio).—38 miles 8-in., authorized, Toledo to Fostoria, Ohio.

Salt Lake Pipe Line Co.—242 miles, 6-8-in., Boise, Idaho-Pasco, Wash., planned. Contracted as follows: Morrison-Knudson Co., Inc., Macco Corp., and Bechtel Corp., 140-mile section from Boise to Baker, Idaho; Pacific Pipeline & Engineers, Ltd., Baker to Pasco, Wash. Pacific Pipeline & Engineers, Ltd.'s, field office, LaGrande, Ore.; L. E. Robertson, spreadman.

63 miles 8-in., Mountain Home to Boise, Idaho; Oklahoma Contracting Corp., contractor; Aldress Kilgore, supt.; R. F. Mueller, paymaster. Office, Mountain Home. Construction under way.

Natural-Gas Pipe Lines

Alabama-Tennessee Natural Gas Co.—80 miles 10-in., under way, Selmer, Tenn., to Muscle Shoals, Ala.; 35 miles 8-in., authorized, Muscle Shoals to Decatur, Ala.

Algonquin Gas Transmission Co. — 276 miles, Lambertville, N. J., to Boston area, proposed.

492 miles laterals, New England area, proposed.

Arkansas-Louisiana Gas Co.—69 miles, 20-in., Waskom, Tex., to Magnolia, Ark.; under construction; Anderson Brothers Corp., contractor; Ralph Pitts, spreadman; field office, Plain Dealing, La.

Atlantic Gulf Gas Co. (United Gas Pipe Line Co.)—1,530 miles, planned, Alabama-Florida-Georgia-South Carolina.

Central Hudson Gas & Electric Corp.—40 miles, authorized, Tuxedo, N. Y., station, Home Gas Co. line now under construction. to Poughkeepsie, N. Y. Britton Construction Co., contractor; field office, Newburgh, N. Y.; spreadman, Curley Hahn; R. L. Carlton, office.

Central Kentucky Natural Gas Co.—36 miles, 12-20-in., planned, Kentucky loops.

Chicago District Pipe Line Co.—41 miles, 24-in., planned, Joliet, Ill., to Chicago.

City of Indianapolis, Ind., Inc.—55 miles 16-in., proposed, Indianapolis to Texas Eastern Transmission Corp.'s system.

Cities Service Gas Co.—47 miles, 3-4-16-in. planned, in Kansas.

Coastal Pipe Line Co.—1,000 miles, planned, Texas to Norfolk, Va.

Colorado-Wyoming Gas Co.—41 miles, planned, Greeley, LaSalle, and Windsor, Colo., areas. Vaughn & Taylor Construction Co., has contract for 30 miles, 10-in., Mesa to Boulder Junction, Colo.; field office, Derby, Colo.; Don Smith, spreadman.

Commonwealth Natural Gas Corp.—537 miles, 20-in., planned, West Bend, Ky., to Norfolk, Va.

200 miles, authorized, Green County, Virginia, to Norfolk.

East Tennessee Natural Gas Co. — 185 miles, 16-in., Lobelville-Chattanooga, Tenn., contracted by Walters & Saigh Construction Co., for construction in 1950; 120 miles, 12-in., Chatanooga-Knoxville, Tenn.; contracted by Walter and Saigh Construction Co., for construction in 1950; Robert E. Floyd, spreadman; field offices, Athens and Cleveland, Tenn.; Carl Doyle, general superintendent; James E. Gray, office manager; 100 miles of laterals to be laid in 1950. Construction 150 miles, 16-in., Knoxville-Bristol, Tenn., under consideration.

El Paso Natural Gas Co.—All work done by company crews.

**Looping of 26-in., New Mexico-California line and connection with Pacific Gas & Electric Co. at Needles, Calif. 352 miles, 30-in., completion November 1950; spreads as follows: 119 miles 30-in., Wenden to Topock, Ariz., Ed Alsup, spreadman; office, Salome, Ariz.; (Spread No. 2 is shut down due to lack of pipe; office, Jal, N. M., Jack Smith, spreadman); 15 miles 2-in., Bowie, Ariz.; G. George, spreadman.

450 miles, 30-in., under construction, Eunice, N. M.-Blythe, Calif., looping; completion March 1950.

450 miles, 24-in., planned, San Juan basin, New Mexico to Franconia, Ariz.

Home Gas Co.—70 miles, planned, Orange, Sullivan-Rockland counties, New York-Cattaraugus County, New York, areas.

Jersey Central Power & Light Co.—39.4 miles, 10-in., planned, New Jersey to Coast system, Texas Eastern Transmission Co.'s Big Inch.

Michigan-Wisconsin Gas Co.—185 miles, 4-14-in. laterals, Milwaukee-Fond du Lac, Sheboygan, and Green Bay, Wis., under construction; C. C. Griffis Construction Co., contractor; Paul Means, superintendent for Lake Del Mort crossing.

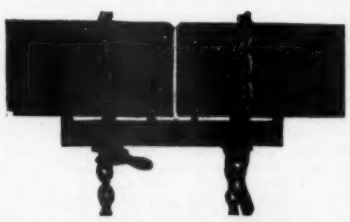
Montana-Dakota Utilities Co. and Montana-Wyoming Gas Pipe Line Co.—340 miles, 12¾-in., planned, Worland, Wyo., to Cabin Creek, Mont.; R. A. Conyes Construction Corp., contractor; Al Poggi, general superintendent; Chester Kincaid and Jimmy Alman, spreadmen; field office, Hardin, Mont.

Montana Power Co.—83 miles, 12¾-in., planned, Butte to Bozeman, Mont.; field office, Three Forks, Mont.; C. N. Deaton, spreadman.

New York State Natural Gas Corp.—83½ miles 16-in., loops, Pennsylvania.

164 miles, 16-in., Ithaca to Albany, N. Y., planned.

70 miles, 20-in., North Oakford Storage pool, Pennsylvania, to Ohio State line.



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So simple—so easy to use—Jewel Tools are proving big time-savers in refinery piping fabrication and erection.

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1841 University Ave.
ST. PAUL 4, MINNESOTA

53 miles, 16-in., loops in Pennsylvania, under construction.

56 miles, 20-in., loops in Pennsylvania and New York; under construction.

Northeastern Gas Transmission Co.—511 miles, up to 20-in., planned, in New England area.

Northern Natural Gas Co.—41 miles, 20-in., under construction, Southwest from Garden City, Kans.; R. H. Fulton & Co., contractor.

597 miles of looping in 10 sections, contracted as follows: R. H. Fulton & Co., loops 1 to 5: loop 1, 40.2 miles, 26-in., extending northward from a point 28.7 miles north of Skellytown station in Pampa, Tex., area; loop 2, Beaver, Okla., station, 74.9 miles, 26-in.; loop 3, Mullinville, Kans., station, 33¼ miles, 26-in.; loop 4, Bushton, Kans., station, 72½ miles, 26-in.; loop 5, from a point west fo Garden City, Kans., to Bushton, Kans., station, 155 miles, 20-in. M. L. Boyd, spreadman; office, Perryton, Tex.; and N. A. Veach, spreadman; office, Liberal, Kans. Midwestern Constructors, Inc., loops 6 and 7; loop 6 from a point 29 miles northeast of Palmyra, Nebr., station, 43.4 miles, 26-in., to Oakland, Iowa, station; loop 7, from a point 17.8 miles northeast of Oakland, Iowa, station, 65.9 miles, 26-in; office, Glenwood, Iowa. R. B. Potashnick, loops 8 to 10; loop 8, southwestward from Ventura, Iowa, station, 31.2 miles, 26-in.; loop 9, northward from Ventura station, 41 miles, 26-in.; loop 10, from the north end of a 26-mile gap beyond loop 9, where another loop will be built consisting of 39½ miles, 26-in.; total 111 miles, 24-in.; field office to be located at Ogden, Iowa, June 1; Boyd, spreadman.

Northwest Natural Gas Co.—750 miles, planned; Washington, Oregon, and Idaho.

Pacific Gas & Electric Co.—506 miles, 34-in., under construction, Topock, Ariz.-Milpitas, Calif.; Bechtel-Price-Conyes, contractor; main-line office, Barstow, Calif.; R. L. Bowman, general superintendent.

Panhandle Eastern Pipe Line Co.—160 miles, additions to present system; approved. Also, 188 miles to be built in conjunction with the 160-mile project, along entire system. (Previously approved by FPC.)

69 miles 26-in. loops, Olpe to Hugoton, Kans.; Midwestern Constructors, Inc., contractor; office, Ottawa, Kans.; M. L. Wilhite, superintendent.

Panhandle Eastern Pipe Line Co.—35(miles, 26-in., authorized, looping in Texas Oklahoma, Kansas, Missouri, Illinois, Indiana, Ohio, and Michigan.

75 miles, 26-30-in., loops in Illinois, Indiana, Missouri; Anderson Brothers Corp., contractor; field office, Rockville, Ill.; J. A. Brown, spreadman; office at Winchester, Mo.; Dewey Whitworth, spreadman. Under construction.

Peoples Gas Light & Coke Co.—Plannec 42 miles, 24-in., Joliet-Chicago, Ill.

Phillips Petroleum Co.—25 miles gathering system in West Edmond, Okla., field, under construction; Vaughn & Taylor Construction Co., Inc., contractor; spread office Edmond, Okla.

118 miles, 3-to-20-in., gas-gathering system in Sherman and Hansford counties, Texas; Vaughn & Taylor Construction Co., Inc., contractor; D. D. Vaughn, spreadman; field office, Texhoma, Okla.

Phillips Petroleum Co.—118 miles 3-26-in., gas-gathering system, Sherman and Hansford counties, Texas; Vaughan & Taylor Construction Co., Inc., contractor; field office, Texhoma, Okla.; D. D. Vaughn and Jess Moore, spreadmen. Work 60 per cent complete.

Piedmont Natural Gas Corp.—1,350 miles, 20-in., planned, Greenville, Miss., to Norfolk, Va.

Plains Natural Gas Co.—78 miles, gathering system, Oklahoma-Kansas area, Hugoton field. Contracted by: Arey-Phillips Construction Co., Amarillo, Tex.; Tulsa Pipe Coating Co., Mid-Western Constructors, Inc., Engineering and supervision. Latter firm represented by Lyle DeWitt; field office, Liberal, Kans.

Roanoke Pipe Line Co.—30 miles 8-in., Gala, Va., to Roanoke, authorized.

South Jersey Gas Co.—77 miles, planned, Camden to Atlantic City.

Southern California Gas Co.—80 miles 30-in., Whitewater to Puente, Calif., under way; field office, Bonning, Calif.

Southern Natural Gas Co.—Following program approved by FPC (Docket G-1308): Schedule for 1950.—180 miles, 18-in., Gwinville, Miss., to Selma, Ala.; 26 miles of 16-in., Selma to Marvin Gate, Ala.; 29 miles of 12-in., Carthage, Tex., to Logansport, La.; 14 miles, 14-in., Logansport to Perryville, La.; 5.8 miles of 8-in., Carthage field, Texas; 13.2 miles, 24-in., Benton-Pickens loop in Louisiana; 4 miles, 24-in., Coosa-Talladega loop, in Louisiana; 4 miles, 24-in., Tallapoosa-Bowden loop in Louisiana; 11 miles of 6-in., Vicksburg loop in Mississippi; 6.2 miles, 12-in., Macon line loop, in Georgia; and the following connecting lines: 5 miles, 8-in., Meridian, Miss.; 1 mile, 8-in., Demopolis, Ala.; 35 miles, 8-in., La Grange, Ga.; 6.3 miles, 6-in., Lanett, Ala.; 6.2 miles, 8-in., Mississippi Chemicals Co. plant; 22 miles, 8-in., Childersburg, Ala.; 2 miles, 6-in., Beaunit Mills; and 12.6 miles, 12-in., Yates plant.

Scheduled for 1951.—45.6 miles, 18-in., and 22.9 miles, 16in., Selma to Marvin Gate, Ala.; 98.1 miles, 16-in., Marvin Gate to Bolingbroke, Ala.; 105 miles, 10-in., Bolingbroke Gate to Augusta, Ga.; 19 miles, 8-in., Augusta to Aiken, Ga.; 27.2 miles, 14-in., and 36.9 miles, 14-in., Logansport to Perryville, La.; 21.4 miles, 24-in., Perryville-Pioneer loop in Louisiana; 14.4 miles, 24-in., Onward Big Sunflower loop, in Louisiana; and the following connecting lines: 18.8 miles, 6-in., Grandville, Ga.; and 15.5 miles, 4-in., Sandersville, Ga.

Southern Union Gas Co.—78 miles, 8-10-14-in., planned, New Mexico loops and laterals.

Tennessee Gas Transmission Co.—65 miles, 16-in., planned, Ohio-Pittsburgh spur.

40 miles, 16-in., Beaver Falls-Pittsburgh, Pa., Britton Construction Co., contractor; office, Beaver Falls; Fred McKenzie, superintendent.

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DRYSEAL THREAD PRESSURE PLUG

. . . seals pressure-tight without the use of sealing compounds. Features the "Dryseal" Pipe Thread originally developed for use with SO_2, ammonia, and other refrigerants. Offers a valuable solution to leakage problems in high pressure equipment of all kinds.

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Incorporates all the important features of the regular UNBRAKO Pressure Plug, including fully formed threads, uniform taper and perfect roundness.

A full range of sizes from 1/16" to 1¼", National Pipe Thread Fuel, is available. Full details are given in Bulletin 675.

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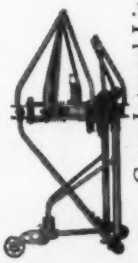
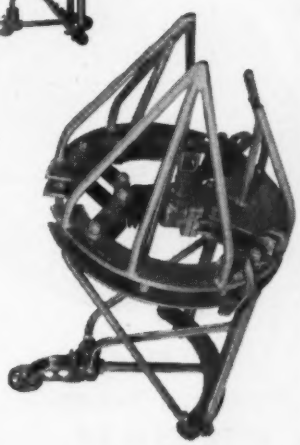
STANDARD PRESSED STEEL CO.

JENKINTOWN 25, PENNSYLVANIA

Internal Lineup



Crose Internal Lineup Clamps are available in manual, electric and hydraulic models for pipe sizes ranging from 12" to 36". Crose Internal Lineup Clamps have been proven in world-wide field operations.



M. J. CROSE MANUFACTURING COMPANY, INC.
2715 Dawson Road Tulsa, Okla. Ph. 6-2173

CLAMPS PIPELINE WELDING

790 miles, 20-26-in., planned, Burnaugh, Ky., to Boston, including 400-mile line to Buffalo.

992 miles, 30-in., planned, first 150 miles of loops to be laid at Monroe, La., Greenville, Miss., Midland and Portland, Tenn.

385 miles 26-in., Greenup County, Kentucky, to New York; contracted to H. C. Price Co., Bartlesville, Okla.

Latex Construction Co. has following contracts: 123 miles, 30-in., West Monroe to Many, La., W. H. Hayes, superintendent, field office, Jonesboro, La.; 95 miles, 30-in., Natchitoches to Kinder, La.; F. A. Silar, superintendent, W. A. Briley, assistant; field office, Kinder, La. 75 miles, 16-in., Kinder to Bayou Sale, La., F. A. Silar, superintendent.

54.3 miles, 30-in., under construction, White Bluff area to Joelton, Tenn., area, contracted to Morrison Construction Co.

36.1 miles, 30-in., under construction, Glasgow, Ky., area to Joelton area, contracted to Morrison Construction Co.

18.1 miles, 30-in., under construction Union City to Buckeye, Ky., Anderson Brothers Corp., contractors.

47 miles 30-in., Glasgow to Lebanon, Ky.; H. C. Price Co., contractor; field office, Scottsville, Ky.; R. L. McMillon, spreadman.

99 miles 30-in., under way, Dickson to Selmer, Tenn.; field office, Dickson, Tenn.; Jack Hodges, spreadman.

63 miles 26-in., Mahoning River near Youngstown, Ohio, southward; H. C. Price Co., contractor; G. A. Reutzel, supt.; field office, Columbiana, Ohio. 63 miles 26-in., Muskingum River northeastward; R. K. Shivel, supt.; office, Zanesville, Ohio; 47 miles 26-in., Muskingum River southwestward; W. B. Williams, supt.; office, McConnelsville, Ohio; 47 miles 26-in., Ohio River northeastward; C. R. Ice, supt.; office, Portsmouth, Ohio. (Balance of 373-mile Ohio River-Buffalo project to be started in August 1950.)

27.7 miles, 12-in., under construction, El Campo, Tex., to near Traitor, Tex.; Massey Construction Co., contractor.

25 miles, 30-in., Hardeman and McNairy counties, Tennessee; H. C. Price Co.; field office, Selmer, Tenn.; J. A. Reutzel, spreadman.

103 miles 30 and 26-in. loops, Premont to El Campo, Tex.; Oklahoma Contracting Corp., contractor; M. E. Shiflett, supt.; Joe Freeman, paymaster. Work under way.

60 miles, 30-in., between stations 104 and 99; Anderson Brothers Corp.; field office, Richmond, Ky.; A. G. Hobson, spreadman. 65 miles, 26-in., Station 110 to Ohio River; field office, Moorehead, Ky.; E. C. McCoy, spreadman.

170 miles of 26 and 30-in., contracted by Anderson Brothers Corp., in Kentucky.

91 miles 30-in., Holly Springs, Miss., south; contracted to Oklahoma Contracting Corp.; Raymond Law, supt.; Gene Gohring, paymaster; office, Holly Springs; work to begin June 1.

Texas-Eastern Transmission Corp.—1,400 miles planned, Texas to Pittsburgh loops.

108 miles 16-in., authorized, Provident City to Baytown, Tex.

Texas Gas Transmission Corp. — 103 miles, 20-in., Carthage, Tex., to near Lisbon, La., (Sharon); under construction; N. A. Saigh Co., Inc., contractor; Carthage, Tex.; Bob Floyd, representative. Construction subcontracted: (1) Fowler Brothers, 43 miles from Carthage to Red River, field office at Carthage; M. C. Johnson, spreadman; (2) 63 miles to Sharon station, Oklahoma Contracting Co. (J. R. Horrigan) field office at Minden, La.; Ed Flanagan, spreadman.

32 miles, planned, Slaughters, Ky., to Evansville, Ind.

Texas Illinois Natural Gas Pipeline Co.—1,400 miles, 30-in., planned, La Gloria field, Texas, to Joliet, Ill.

58-mile, 20-in. lateral, Joliet terminal to connection with Natural Gas Pipeline Co. of America near Volo, Ill.

Transcontinental Gas Pipe Line Co.—Texas-New York 1,840 miles, 30-in., main line and 500 miles, 4 to 22-in., gathering line. Section of 605 miles of 30-in. nearing completion.

Section 6, Newman, Ga., to Danielsville, Ga., 108 miles; Williams Brothers Co.; field office, Monroe, Ga.; Thelmer Davis, spreadman. Section 7, Danielsville, Ga., to Saluda River, South Carolina; 86 miles; Williams Brothers Co. Section 8, Saluda River, South Carolina, to Catawba River, North Carolina, 102 miles; R. H. Fulton & Co. Section 9, Catawba River, North Carolina, to North Carolina-Virginia boundary, 100 miles; Clark Williams, spreadman; field office, Spartanburg, S. C. R. H. Fulton & Co.; A. A. Corrigan, supt.; Clark Williams, general supt. Section 10, North Carolina-Virginia boundary to James River, Virginia, 86 miles; O. R. Smith Contracting Corp. Section 11, James River, Virginia, to Potomac River, Virginia; 110 miles; O. R. Smith Contracting Corp. Section 12, Potomac River, Virginia, to Susquehanna River, Pennsylvania, 76 miles; Associated Engineers & Contractors, Inc., spreadman, Cecil Rogers; field office, Towson, Md.; Section 13, Susquehanna, Pennsylvania, to Delaware River, 90 miles; Wunderlich & Griffis Construction Co. Section 14, Delaware River to Hackensack River, New Jersey, 61 miles; Wunderlich & Griffis Construction Co. Section (unnumbered), Hackensack River, New Jersey, to Hudson River, New York, 23 miles; Oklahoma Contracting Co.; field office, Edgewater, N. J.; M. E. Shiflett, spreadman.

616 miles main and gathering lines west and south of Eunice, La. (361.1 miles is for main line and 255 miles for gathering lines.) Contracted as follows:

Schedule A.—Mercedes to south of Falfurrias, Tex., 80.1 miles 10 to 14-in. main line; Massey Pipe Line Construction Co., contractor; work to start in April or May.

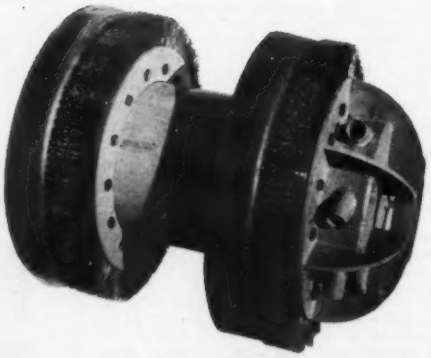
Schedule B.—South of Falfurrias to Edna, Tex., 153.1 miles, 24 and 26-in. (H. B. Zachary Co., San Antonio, has contracted laying of 108 miles 24-in. in Schedule B.) Remaining 45 miles yet to be contracted. Work starts September 1.

Schedule C.—Edna to Porters, Tex., 114.9 miles, 26 and 30-in., to start in August. Contract to be announced.

Williamson Gas Line Pigs* Traverse 1½R 90° Bends

← 24" Size
New Design
TYPE GP PIGS
with Brushes
Mounted on Arched
Springs to
Compensate for
Wear

30" Size →
Standard Design
TYPE RCN-50
with
Jet Rotation
Feature to
Distribute
Wear



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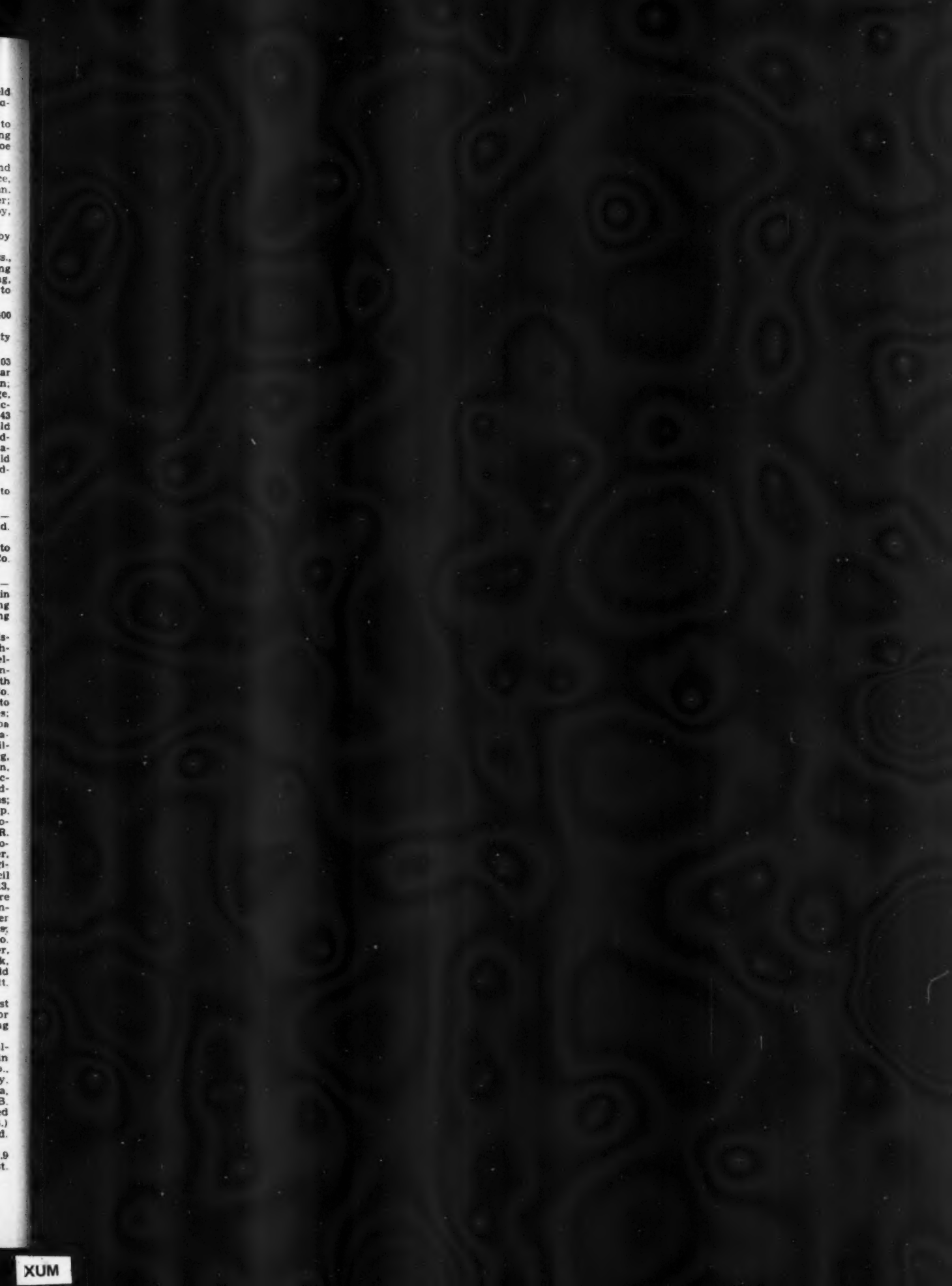
Above Designs Available in 16" and Larger.
Other Designs as Small as 2".

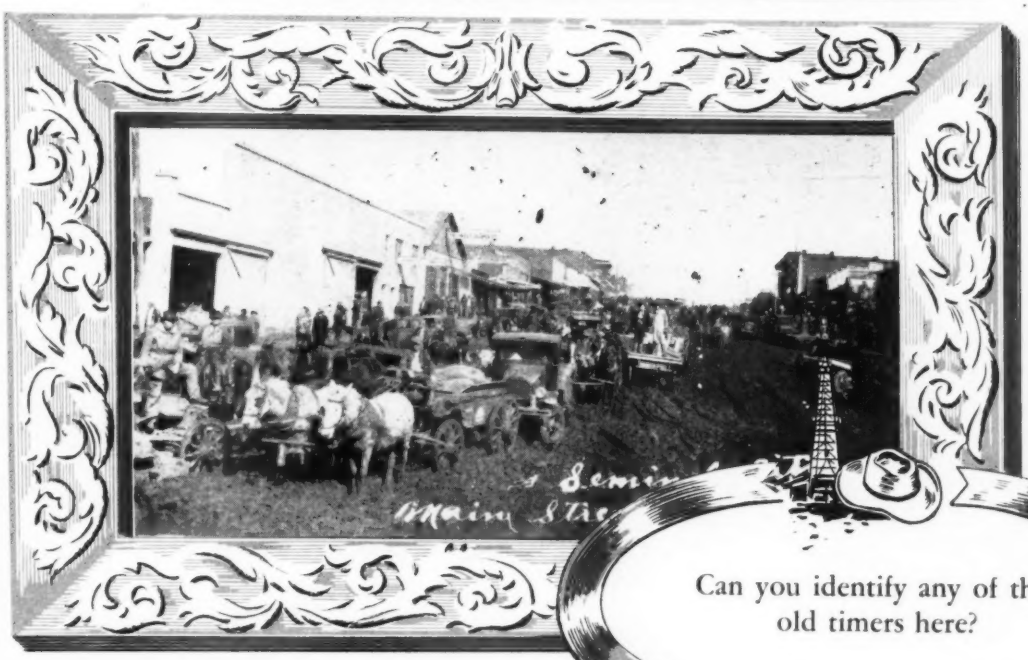
THE PIG WITH THE POKE
CLEANS PIPE LINES

T. D. Williamson, Inc.
TULSA 9, OKLAHOMA



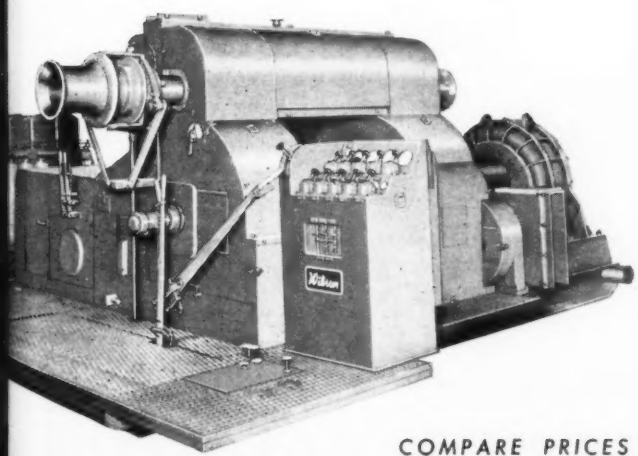
XUM

REMEMBER SEMINOLE?



Can you identify any of the old timers here?

We will probably get picturesquely profaned for this. No present day Seminolian would ever believe the Main Street of their fair city once looked like this. Shawnee or Wewoka, maybe, but not Seminole! Strange as it may seem, this is Seminole in the Boom Days.



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COMPARE PRICES BEFORE YOU BUY!

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YOU CAN DO IT EASILY WITH

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LOW WATER LOSS. In general, 1 to 1½ pounds of Driscose per barrel in uncontaminated mud, can hold water losses to 4 cc or ess. In salt contaminated areas, Driscose can maintain or re-establish a stable mud. Anhydrite, too, can be drilled without the removal of calcium sulfate. Driscose helps maintain desired mud properties at low total cost.

PHYSICAL PROPERTIES. Driscose dissolves easily in hot or cold water. Makes a thin, strong filter cake which stands up under high temperatures . . . no fermentation problems. Stays on the job for weeks, helping prevent costly delays. Low bentonitic dispersion. Less weighting material required.

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PRACTICAL for practically every drilling area! Our mud engineers will study your drilling mud problem . . . at no cost or obligation to you . . . and estimate in dollars the savings you can expect by using Driscose. Write for complete information.

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DRILLING SPECIALTIES COMPANY

BARTLESVILLE, OKLAHOMA

More Reef Production Found in Kent

DEVELOPMENT and exploration in Kent County have progressed at a steady pace over the past several weeks, but results so far have not been conclusive and of course will not be until other wells, plus wildcats now drilling, have completed.

A sizable pool of Canyon reef production has evidently been established in the Hunt-Young field of west-central Kent County, and based on two offset producers now completed, and a long south and east stepout nearing completion, the field may trend off in a northwest-southeast direction, with the possibility of present production being on the flank of the structure.

The Hunt - Young field's second completion, a west offset, was Nelson Bunker Hunt Trust Estate 1 Mary Couts Burnett Trust Estate, located 1,110 ft. from north and 467 ft. from east lines of Section 3, D. R. Stout Survey. This well had the reef at 6,217 ft., or minus 4,023 ft., which in less than ¼ mile was 103 ft. higher on the reef formation than was the discovery. Completion potential of the second well was 645 bbl. of oil a day through ⅜-in. choke, from perforations in 52 ft. of pay at 6,464-6,516 ft. Top of the reef was 6,217 ft. and cores from 6,220-6,313 ft. recovered oil-saturated lime. Top of pay, however, was placed at 6,450 ft. Total depth was 6,559 ft., plugged back to 6,550 ft.

Half a mile south of the discovery, Caroline Hunt Trust Estate 2 J. W. Young, located 1,060 ft. north and 660 ft. east of the southeast corner, Section 3, D. R. Stout Survey, but in Section 145-G-W&NW, had the reef at minus 4,137 ft., or 11 ft. lower than the 1 J. W. Young discovery. Completion potential on the 2 Young was 726 bbl. of oil a day, flowing through 24/64-in. choke. Based on a drill-stem test from 6,535-58 ft., top of the water table was around minus 4,450 ft.

Kent County operators have been following reports on Estill S. Heyser, Jr. 2 L. T. Lohman, semiwildcat in NW NW 114-G-W&NW, 2 miles south of the Caroline Hunt 1 Young, and one location east. Having picked top of the reef at 6,470 ft., or minus 4,343 ft., the well indicates a gradual slope south or possibly southeast of the discovery. Operators were confident the 2 Lohman would make a well, as it had about 105 ft. of reef with saturation, and at last report preparations were under way to perforate. Pipe had been set at 6,516 ft. Total depth was 6,530 ft. and elevation was 2,127 ft. Based on the water table found in the field, the Heyser test would have 107 ft. of reef above water.

Other Kent County explorations that will determine future drilling included an offset producer at Clairemont field, just south of the Clairemont townsite. This field was first called Strawn but there remains some controversy as to the producing horizon. Field reports generally refer to it as Pennsylvanian at this time.

At any rate, confirmation production from the Pennsylvanian has been established by Sun Oil Co. at its 1 D. G. Sampson, an east offset to the discovery, in 9-98-H&TC. Total depth was 6,761 ft., with 7-in. casing set at 6,744 ft. After testing to clean, the well flowed 211 bbl. of oil and 1 bbl. of mud through 13/64-in. choke in 24 hours, with no appreciable amount of water. Tubing pressure was 500 psi., casing pressure was 585 psi. and gas-oil ratio was up to 723 cu. ft.

In southwest Kent County, 4½ miles northwest of Cogdell field, Kewanee Oil Co. 1-C Wilson Connell, 330 ft. out of the northeast corner of 3-4-H&GN, prepared to core ahead from 6,870 ft. in lime after recovering free oil on a drill-stem test. Top of the reef was called at 6,850 ft., minus 4,630 ft., and a 2½-hour test was run from 6,845-6,870 ft. Gas came to the top in 15 minutes and recovery was 2,535 ft. of 37°-gravity oil, plus 470 ft. of oil and gas-cut mud, estimated to be 90 per cent oil. Flowing pressure was 500 psi.

Spartan Drilling Co. et al 1 Wallace Estate, NW NW SE 97-G-W&NW, ¾ mile southwest of the same operators' 1 J. W. Young, a lower Strawn discovery at 7,353-59 ft., and 11 miles west of Clairemont, was drilling ahead at 7,564 ft. A drill-stem test from 7,356-64 ft., open 80 minutes, recovered 110 ft. of gas and 60 ft. of oil and gas-cut mud.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—In northern Hockley County, 8 miles west and 1 mile south of production in Anton-Irish field, Humble Oil & Refining Co. 1 J. J. Hobgood, Labor 10, League 693, State Capitol Lands, had good indications of Clear Fork pay. A 2-hour drill-stem test from 6,570-6,610 ft. had gas in 70 minutes and recovered 120 ft. of heavily oil and gas-cut mud, plus 400 ft. of mud-cut oil. Flowing pressure ranged from 100-268 psi. and 15-minute buildup was 2,365 psi. The Texas Co. 1-X State, Martin County deep wildcat, washed and acidized from 13,342-420 ft. then swabbed down to 2,800 ft. in 6 hours.

NORTH TEXAS.—Ted Weiner 1 Olin Calvin, Mississippian discovery in Archer County, 2 miles southeast of Anarene, completed in pay topped at 5,207 ft. and drilled to 5,227 ft. After treating with 250 gal. of mud acid it flowed 634 bbl. of fluid, of which 239 bbl. were oil and the remainder water, through 9/64-in. choke in 24 hours. Pressures were 760 psi. on casing and 420 psi. on tubing. Gravity of the oil was around 45°, and gas-oil ratio was 500 cu. ft.

ROCKY MOUNTAIN AREA.—Stanolind Oil & Gas Co.'s 1 Ute Indian, wildcat in the Ignacio area of the San Juan Basin (Colorado), blew out with an estimated 5,000,000 cu. ft. of gas daily from base of the Animas formation. Pure Oil Co. has some gas in its deep Badwater, Wyoming, test (1 Unit) and is now coring below 15,016 ft. Shows of oil are being tested by Bay Petroleum Corp. at its 1 Unit, Wallace Creek, Wyoming, venture.

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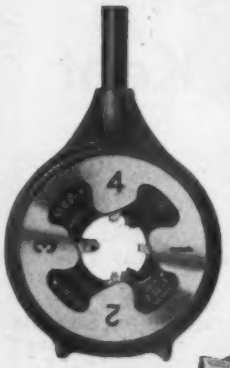

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Southwest Texas

McMullen County Wildcat Is Completed as Gas Well

CORPUS CHRISTI.—Delhi Oil Corp. has completed the 1 Lula W. Pursch et al, BS&F Survey 116, Abstract 1,604, McMullen County, for a gas discovery and has shut the well in. Through perforations at 7,165-90 ft., the well flowed 15,000,000 cu. ft. of gas daily on open flow. The wildcat was drilled to a depth of 8,009 ft. and operators set 5½-in. pipe to 7,337 ft. for completion.

Also in McMullen County, Stanolind Oil & Gas Co. has drilled to a depth of 8,021 ft. in the 1 Hagist Ranch, Inc., wildcat venture in the R. W. Mills Survey, 10 miles north of Freer. Operators are now waiting on cement to set in the test.

Three miles northwest of Freer in Duval County, Ralph E. Fair and Woodward & Co. have gaged the 1 C. W. Hahl, gas discovery in the E. Rodriquez Survey 56, Abstract 1,881 ft., for 1,990,000 cu. ft. of gas daily through a ⅛-in. choke, with the tubing pressure 1,760 psi. Test was made through open hole from 7,575-7,610 ft. Gas-condensate ratio was 39,000 to 1, with the gravity of the condensate being 48.3°.

One mile northeast of Superior Oil Co. 1 M. S. Welder, a dually completed discovery well in the 7,300-ft. and 8,100-ft. sands, Plymouth Oil Co. perforated from 7,135-40 ft. in the G-1 R. H. Welder and recovered 5,100 ft. of salt water. Perforations were squeezed and operators are preparing to retest. The wildcat is located in Section 32 of the R. H. Welder Ranch Subdivision, San Patricio County.

LaParita Oil Co. ran a drill-stem test in the Stringer sand in the 1 Tom Novosad, John Neal Survey 1,190, Atascosa County wildcat. Operators found 1 ft. of oil sand at the discovery level (1,500 ft.), ran a drill-stem test, and recovered fresh water. They are now drilling ahead to contract depth. The well is an east offset to the 1 Ventreck, the discovery well.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Duval County: Gas discovery—Ralph E. Fair and Woodward & Co. 1 C. W. Hahl, E. Rodriquez Sur. 56, A-1,881, 3 mi. NW of Freer, TD 7,610 ft., open hole 7,575-610 ft., IP: 1,990,000 cu. ft. of gas daily, ¼-in. choke, TP 1,760 psi., CP 1,900 psi.

Jim Wells County: Gas discovery—The Texas Co. 1 Ed C. Adams, Juan Hernandez Sur. 10, A-204, 2 mi. W of Alfred, TD 4,105 ft., perf. 2,500-10 ft., IP: 8,300,000 cu. ft. of gas daily, open flow, SITP 1,068 psi.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Bandera County: Chemical Attraction Co. 1-A C. J. Zwanzig, Antonio Curvier Sur. 71, ½ mi. NE of Medina, dry, TD 315 ft.

Bastrop County: Homer S. Head 1 Thomas B. Martin et al, James Standifer League, 4½ mi. S of Elgin, dry, TD 2,643 ft.

Jesse White 1 Howard Smith, James Cassedy Sur., 4 mi. SW of Cedar Creek, dry, TD 1,809 ft.

Youngblood Well Service 1 Earl C. Erhard, James Stewart Sur., 15 mi. SW of Bastrop, dry, TD 1,858 ft.

Bexar County: W. E. Sultenfuss et al 1 Lydia Conaway, Juan Montes Sur., 10 mi. SE of San Antonio, dry, TD 1,156 ft.

Caldwell County: John B. Coffee 1 Adolf Seeliger et al, J. M. Baker Sur., A-46, 4 mi. N of Lockhart, dry, TD 1,693 ft.

Duval County: C. C. Dauchy and Miller Royalty Co. 1 Con Mims et al, C&MRR Sur. 114, ½ mi. W of Hoffman field, dry, TD 3,167 ft.

Far West Oil Co. 1 Welder Heirs, Samuel Alexander Sur., 2 mi. SW of Seven Sisters, dry, TD 2,722 ft.

Sid Katz et al 3 Lucille Gruy, S. G. Hayes Sur. 156, 12 mi. NW of Realitos, dry, TD 1,950 ft.

Guadalupe County: C. C. Tedford, Jr. 1 H. H. Alderman, Ben Fuqua ¾ League Grant, 4½ mi. E-NE of Seguin, dry, TD 2,085 ft.

Hidalgo County: Amerada Petroleum Corp. 1 T. & N. O. RR., Santa Cruz Ranch Subd. of El San Salvador Del Tule Grant, dry, TD 11,105 ft.

Taylor Refining Co. and Mayfair Mineral, Inc. 1 B. F. M. Klump, Porcion 70, 8 mi. S of Pharr, dry, TD 11,618 ft.

Jim Hogg County: Calhoun & Campbell 2 R. Holbein, Share 3, Los Animas Grant, 17 mi. SE of Mirando City, dry, TD 1,510 ft.

San Patricio County: Southern Minerals Corp. 6 Katherine Clifton, J. B. Wilson Sur., A-381, 1½ mi. S of Tynan, dry, TD 5,413 ft.

Webb County: Calohan & Campbell 1 Albert Martin, Trust, Sur. 691, 4 mi. N of Bruni, dry, TD 3,012 ft.

Ouachita County: C. G. Davis 1 H. L. Curry, SW SW SW 33-14s-19w, dry, TD 2,352 ft.

Louisiana-Arkansas

De Soto Parish Wildcats Are Preparing to Test

SHREVEPORT.—Stanolind Oil & Gas Co. 1 Meadors, NE NW 8-22n-5w, 3 miles southeast of Colquitt, in Claiborne Parish, was drilling ahead at 5,625 ft. after taking 13 side-wall cores from 4,111-5,230 ft., with no shows. By electric log it had the Massive anhydrite from 3,910-4,115 ft., top of the Sligo at 5,092 ft., and the Travis Peak at 5,278 ft. It was still in the latter formation at last report.

John E. Yorger 1 Crow, approximately NW NW 15-11n-10w, DeSoto Parish, was drilling below 1,506 ft. in the Cretaceous. It was originally started as a wildcat Nacatoch test, and 8 side-wall cores in that section from 1,100-90 ft. recovered sand with a slight oil show, but no test was reported.

Petersen Drilling Co. 1 M. Senseman, 20-14n-7e, Franklin Parish, was drilling in the Midway at 3,160 ft. It is a new wildcat, scheduled to the Paluxy.

Jack Manning 1 Sabine Lumber Co., 13-8n-13w, Sabine Parish, prepared to test through perforations at 3,602-06 ft. Casing had been set on bottom at 3,622 ft. According to unofficial reports, a gas sand was cored around 3,600-14 ft.

David M. Lide 1 State-Harris "Unit," 40-12n-12e, was drilling below 8,333 ft. in the upper Cretaceous. Five feet of sand, with no shows, was cored at 8,103-08 ft.

T. J. James & Co. 1 J. T. Burden, 36-23n-2w, was drilling below 6,577 ft. in the Cotton Valley formation, topped at 5,960 ft., by samples. A core from 6,320-6,417 ft. recovered sand and shale with no shows.

In Downsville field of Union Parish, Monia Gas Co., W. C. Feazel et al 1 Hinton-Allen, 9-19n-1e, was dry at 12,271 ft., plugged back to 10,210 ft. Extensive testing produced some lightly gas-cut mud around 9,200 ft. and 9,600 ft. Logged tops were: Massive anhydrite 3,339-3,552 ft., Travis Peak 4,723 ft., Cotton Valley 7,677 ft., and by samples the Smackover was entered at 11,050 ft. Elevation was 246 ft.

NORTH LOUISIANA WILDCAT FAILURE

Concordia Parish: Danciger Oil & Refining Co. 1 H. A. Turner, 1,955 ft. N, 2,158 ft. E of SW corner, 56-8n-10e, dry, TD 7,013 ft., elev. 67 ft., Cockfield 1,432 ft., Cook Mountain 2,036 ft., Sparta 3,121 ft., Wilcox 3,532 ft., Midway 6,880 ft.

ARKANSAS WILDCAT FAILURES

Jefferson County: Rambo & Stephens 1 J. D. Nivens, NW NW NE 16-3s-8w, dry, TD 3,110 ft., Midway 2,110 ft., Arkadelphia 2,505 ft., Nacatoch sand 2,838-63 ft., Saratoga 2,945 ft., base Austin chalk 3,002 ft., Paleozoic 3,074 ft.

Nevada County: H. T. Pannel 1 Austin Caudle, NE NW SW 4-14s-22w, dry, TD 2,615 ft., elev. 320 ft., Nacatoch 1,127 ft., base annona 1,746 ft.

Eastern Texas

Titus County Prospect To Test Saturated Sand

DALLAS.—W. M. Coats and others have set 5½-in. production string at 4,581 ft. to test a Paluxy sand at their 1 Josephine Chamness, Titus County wildcat 14 miles east of Talco, in the Allan Samuel Survey. Fifteen feet of solid saturation was reported from 4,565-80 ft. If productive, it was to attempt completion at that depth.

In Wood County, 5½ miles northeast of Quitman, Watson W. Wise 2 J. E. Brown had total depth at 3,950 ft. and was to start coring. Location is on an 83-acre tract in the J. C. Clark Survey, and 660 ft. southwest of the 1 Brown, sub-Clarksville discovery.

In Henderson County, Gene Goff 1 H. H. Richardson was reported as a proposed Woodbine wildcat 5 miles south of Brownsboro. Location was to be on the west 41 acres of an 82-acre tract in the R. C. Morris Survey. Companies said to be supporting the 5,000-ft. venture included Humble Oil & Refining Co., Stanolind Oil & Gas Co., and Continental Oil Co. The above location is about 2½ miles north of The Texas Co. 1 E. T. Brown, Eans Survey, which was dry at 9,965 ft.

In Freestone County, Humble 1 P. D. C. Ball, J. Y. Aguilera Survey, 9½ miles south-

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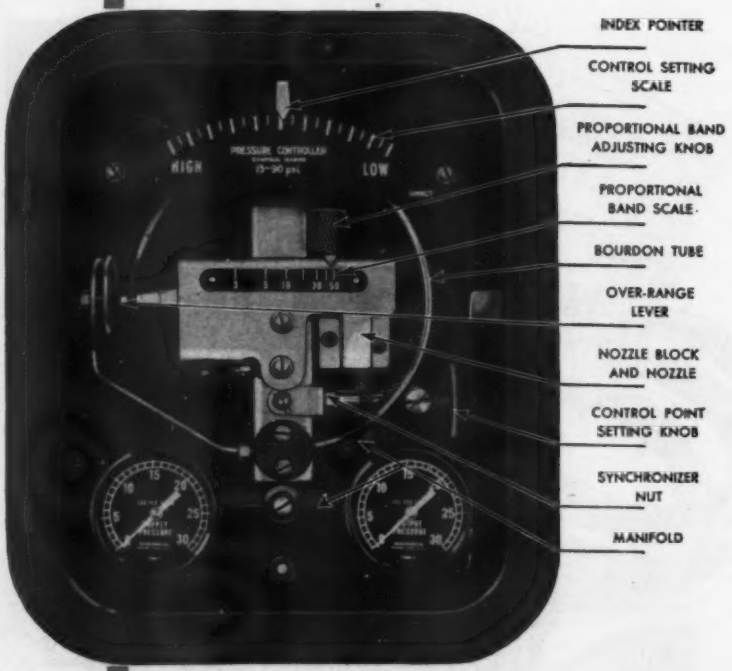

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east of Fairfield, was coring in red beds at 9,473 ft. A core from 9,397-9,447 ft. recovered 50 ft., being 38 ft. of nonporous sand and 12 ft. of red beds, with no shows.

In Rusk County, McAlester Fuel Co. staked location for its 1-A Bennetta Purse 4,135 ft. east of west line and 1,320 ft. north of south line of the Dan Martin Survey, A-526. The 7,500-ft. wildcat is 11 miles southeast of Tatum.

Two miles southwest of Pine Hill, Rusk County, The Texas Co. 1 Clarke, William Howeth Survey, was drilling below 7,324 ft. in shale and lime. The same company 1 Fannie Sorrells, Thomas William Survey, 1 mile southwest of Mt. Enterprise, was drilling shale at 6,306 ft.

EASTERN TEXAS (DISTRICTS 5, 6 AND 6-P) SUCCESSFUL WILDCATS

Cherokee County: Union Producing Co. 1 Sanders, 102-acre tract, F. J. Anthony Sur., 8½ mi. NE Jacksonville, TD 5,000 ft., perf. 50 shots, 4,313-23 ft., est. 105,-500,000 cu. ft. of gas a day, open flow, rock pressure 1,405 psi., distillate not gaged.

Nacogdoches County: Humble Oil & Refining Co. 1 Mrs. Ruth Frank, Jefferson Wilson Sur., Block 8, 4 mi. SE Douglass, TD 9,621 ft., elev. 367 ft., PB 9,250 ft., perf. 8,044-60 ft., flowed 3,075,000 cu. ft. of gas a day, 5/16-in. choke, plus 3 bbl. of 48°-gravity oil, 4 bbl. salt water.

Navarro County: Coffield & Guthrie, Inc. 1 A. M. Kelley, 40-acre tract, M. Autrey Sur., 2 mi. S Navarro, TD 3,001 ft., elev. 352 ft., Woodbine 2,974 ft., pay 2,965 ft., pumped 31.25 bbl. of 36°-gravity oil a day, plus water.

EASTERN TEXAS (DISTRICTS 5, 6 AND 6-P) WILDCAT FAILURE

Cass County: Henry King and Howard Carney 1 A. D. Campbell, 183-acre tract, W. S. Grace Sur., N of Queen City, dry, TD 4,510 ft., elev. 312 ft.

Appalachian Field

Two Successful Tests Completed in W. Va.

PITTSBURGH,—In Steele district, Wood County, West Virginia (Limestone Hill area), United Carbon Co. et al 1-1682 Mary Elizabeth Stuckey, elevation 960 ft., gaged 12,996,000 cu. ft. of gas, natural, rock pressure in 15 hours 800 psi. Corniferous lime was logged at 5,150 ft. and Oriskany sand at 5,281 ft.; gas at 5,281 ft., total depth 5,290 ft. In the same area, Columbian Carbon Co., 1-GW-1145 Godfrey L. Cabot (A. E. Dye Tract), elevation 823 ft., tested 440,000 cu. ft. of gas after shot. Corniferous lime was topped at 4,930 ft., Oriskany sand at 5,046 ft., and total depth is 5,126 ft. Two good shallow sand gas wells were reported: Baileysville district, Wyoming County, United Producing Co., Inc. 96-1678 W. M. Ritter Lumber Co., tested 2,974,000 cu. ft. of gas after shot in the Berea sand, total depth 4,051 ft.; Lee district, Mingo County, R. M. Kolze, Trustee, 1 Virginia Steep resulted in 1,679,000 cu. ft. of gas, natural, from brown shale, total depth 3,833 ft.

In Unity Township, Westmoreland County, Pennsylvania, Peoples Natural Gas Co. 1-3921 Fred Musnug, elevation 2,100 ft., is drilling at 1,670 ft., and in Georges Township, Fayette County, Orville Eberly et al 1 N. E. Murphy, elevation 2,560 ft., is drilling at 7,761 ft.

WEST VIRGINIA SUCCESSFUL WILDCATS

Wood County, Steele district: United Carbon Co. et al 1-1682 Stuckey, elev. 960 ft., 12,996,000 cu. ft. of gas, natural, Corniferous lime 5,150 ft., Oriskany sand 5,281 ft., gas 5,281 ft., TD 5,290 ft.

Columbian Carbon Co. 1-GW-1145 Godfrey L. Cabot, Inc. (Dye Tract), elev. 823 ft., 440,000 cu. ft. of gas after shot, Corniferous lime 4,930 ft., Oriskany sand 5,043 ft., gas 5,046 ft., TD 5,126 ft.

Rocky Mountain

Stanolind Wildcat Boosts San Juan Gas Outlook

DENVER.—At its Ignacio, Colo., wildcat Stanolind Oil & Gas Co. is coring ahead in the Pictured Cliffs formation below 2,540 ft. after topping Pictured Cliff at 2,510 ft. During the past week the well blew out with an estimated gas flow of more than 5,000,000 cu. ft. daily from a sand between 2,440-45 ft. in the base of the Animas formation. The well is 1 Ute Indian, C SE NE 18-33n-7w, just across the New Mexico state line in LaPlata County, Colorado. The gas encountered is dry, with no distillate reported in the mud, and is inflammable.

The discovery is considered of importance in future gas operations for the general San Juan Basin. Stanolind has a unitized block covering the Ignacio area but had as original objective of the well the Dakota at depths below 7,500 ft. During the past year there has been a great deal of wildcat drilling, the majority across the line in New Mexico, to develop gas reserves for proposed gas pipe lines from the region.

Slick-Moorman Oil Co. is now joining with Stanolind in unitizing a large acreage spread in the El Huerfano area, south of the Kutz Canyon area, and has announced location at 1 Unit, C NW 24-26n-10w, a wildcat in San Juan County, New Mexico. Other wildcats are planned in this part of the San Juan Basin, including a test by Delhi on an acreage spread recently farmed out from Atlantic in the area north of the town of Aztec, 20 miles south of the Ignacio wildcat. Production through this area has been increased in the Pictured Cliffs sand as a result of shooting the formation.

Pure Oil Co. has 11,783 ft. of open hole at its 1 Unit, SE NE NW 35-29n-89w, wildcat in the Badwater area, Natrona County, Wyoming, and is now coring below 15,016 ft. on the well. During the past week the operator spent several days in conditioning mud before pulling drill pipe to prepare to core. The mud was badly gas cut and it was necessary to increase the weight to 12-lb. mud prior to starting to core. No tests have been made of the zone and there is no accurate knowledge of the amount of gas encountered in the well.

At is present depth, this well may be in the Mesa Verde zone, possibly correlating with an oil-producing zone found by Pure in its West Poison Spider field, southeast of Badwater. This well is located on an extremely large surface feature along the north side of the Wind River Basin and Pure did extensive seismic work in the area prior to making location. The well had as original objective the Frontier sands, also productive at West Poison Spider at depths around 14,000 ft. However, apparently Frontier will be more than 2,000 ft. lower than the well's present depth. Outcome of the present test is of great importance for future wildcat operations in this general area of the basin.

Shows of oil were logged at Bay Petroleum Corp. et al 1 Unit, SE SW NE 15-34n-87w, wildcat in the Wallace Creek area, Natrona County, Wyoming, and the operator is now testing that formation. Muddy was topped at 10,532 ft. (?) and a core 10,574-84 ft. showed 5 ft. of well-saturated sand and 5 ft. of shale. The well is at 10,587 ft., total depth, and is planned as a Lakota sand test. The operators also found shows of gas in the Shannon sand, but the zone was not commercial.

WYOMING SUCCESSFUL WILDCAT

Happy Springs, Fremont County: Sinclair Oil & Gas Co. 1 Unit, SE SW SW 16-28n-93w, 10,034 TD, PB 6,590, swabbed 106 bbl. oil per day from Muddy sand between 6,550-75 with 98 holes, 9⅝-in. casing 7,528. Tops: Shannon 3,088, Mowry, 6,055, Muddy 6,513, Thermopolis 6,571, Lakota 6,697, Morrison 6,879, Sundance 7,088, Nugget 7,269, Chugwater

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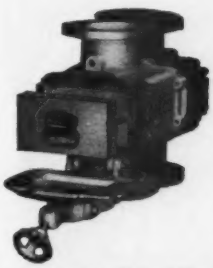

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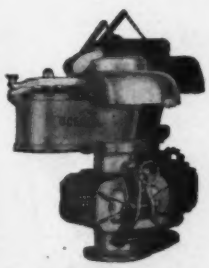

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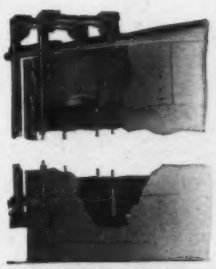

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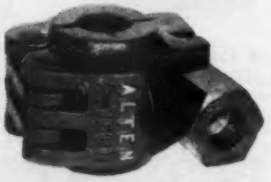

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7,526, Alcova 8,173, Dinwoody 9,314, Phosphoria 9,437, Tensleep 9,971.

WYOMING WILDCAT FAILURE

Immigrant Trail: Carter Oil Co. 1 Unit C-174, C SE NW 32-30n-93w, 6,592 TD. Tops: Base Granite 3,080, Phosphoria 3,377, Dinwoody 3,430, Thrust Fault 3,960, Muddy 4,027, Dakota 4,178, Lakota 4,244, Morrison 4,260, Sundance 4,553, Gypsum Springs 4,697, Nugget 4,726, Chugwater 5,117, Alcova 5,414, Dinwoody 6,174, Phosphoria 6,223, Tensleep 6,540.

SOUTH DAKOTA WILDCAT FAILURE

Piedmont area, Meade County: E. B. Kucera 3 Gingrass, C SW NE 19-3n-7e, 1,235 TD. Tops: Spearfish 365, Minnekahta 852, Opeche 912, Minnelusa 1,035.

California

Shell Opens New Pool In Antelope Hills Area

LOS ANGELES.—Shell Oil Co. has brought in its fee 63X-23 wildcat in the Antelope Hills area of Kern County as a new pool discovery. Located in 23-27s-19e, and 3½ miles northwest of Antelope Hills field, the well was completed flowing at the rate of 500 bbl. a day of 15.3°-gravity clean oil through perforations at 2,267-2,360 ft. Producing formation has not been revealed, although it is assumed to be sand of middle Miocene age. Shell has several sections around the well and is expected to undertake a rather conservative development program in view of the low gravity of the oil.

A revival of interest in the oil possibilities of San Mateo County is reflected in two wildcat locations made during the past week. Jergins Oil Co. will drill a test in 27-7s-4w, while The Texas Co. will drill 3 miles south in 4-8s-4w. The region has attracted prospectors for over half a century due to numerous oil seeps. a few shallow wells were drilled many years ago that yielded a little high-gravity oil for a short time. Several companies are now engaged in leasing campaigns all the way from Half Moon Bay to Pigeon Point.

The Mattole River Valley in Humboldt County, another area known for its oil seeps, will be tested soon by Independent Exploration Co., which has made a location for 1 Roscoe in 34-2s-1w. Oil and gas indications are found at several points in this part of the country. One of the first oil wells completed in the west was brought in in 1865, 7 miles northwest of new location. There is presently no oil production in the county, although The Texas Co. discovered a commercial gas field near the town of Eureka in 1937.

Prospecting is continuing on the Carrizo Plain in San Luis Obispo County despite many disappointments. The Texas Co. has made a location for its third test on the Grayson-Owen property in 13-31s-18e. The company drilled two dry holes here last year. Twelve miles north, in 8-29s-19e, Pacific Oil & Gas Development Corp. is preparing to deepen its 45-8 McDonald. This well was drilled to 4,200 ft. and work suspended 60 days ago.

The second well has been successfully completed in the recently discovered Morales pool in the northern part of the Cuyama Valley. Southern California Petroleum Co. brought in 54 Schlaudeman in 10-11n-28w, pumping 135 bbl. a day of 36°-gravity oil, 1.0 per cent cut. Total depth is 2,360 ft., with top of the Morales oil sand logged at 2,115 ft. The well is a northwesterly offset to the Hancock-Oceanic-Mohawk discovery well. Southern California Petroleum is drilling a second well and has locations for two more. Bishop Oil Co. is drilling 67 Travers, three locations south of the discovery well, and Richfield Oil Corp. has staked location for its first well, the 76A

O'Day, which will be drilled one location southeast of the discovery.

Macson Oil Co. continues to work on its 1 Radovich in 26-5n-17w, near Castaic in Los Angeles County. Water trouble has prevented the successful completion of this shallow discovery.

CALIFORNIA WILDCAT FAILURES

Fresno County, Burrel area: L. M. Lockhart, 1 Schultz, 27-16s-18e, dry, TD 6,842 ft., elev. 211 ft.

Kern County, Mountain View area: Signal Oil & Gas Co., 74-12 Signal-Merz, 12-30s-28e, dry, TD 3,966 ft., elev. 462 ft.

Kings County, Hanford area: Goshen Syndicate, 1 Drummond-Union, 36-18s-22e, dry, TD 5,835 ft. in gray sand, had few noncommercial oil and gas shows, elev. 246 ft.

Los Angeles County, Los Llajas area: Union Oil Co., 12 Simi, 23-3n-17w, dry, TD 1,135 ft., elev. 1,960 ft.

San Luis Obispo County, Carrizo Plain area: E. T. Willard and Independent Exploration Co., 2 Rector-Avenales, 8-29s-19e, dry, TD 1,905 ft., elev. 3,177 ft.

Tulare County, Terra Bella area: J. Glen and Juliet Crist, 1 Minnie, 18-24s-28e, dry, TD 1,202 ft., elev. 675 ft.

Texas Gulf Coast

Austin County Gets New Wilcox Sand Pool Opener

HOUSTON.—A Wilcox-sand oil pool is being opened in Austin County, 4½ miles southwest of Bellville. G. S. Hammonds 1 Walter Schneider, Cummings Survey, is flowing 43.6°-gravity oil and wash water as it cleans through a ¼-in. choke from perforations at 10,061-76 ft. Working pressure is 320 psi. After final completion at this level, operator plans to attempt dual completion at 10,585 ft.

John W. Mecom 1 General Crude has been completed for a new pay on the northwest flank of Esperson dome, Liberty County. On a 24-hour potential, the well gaged 279 bbl. of 41.8°-gravity oil through a 5/32-in. choke. Flowing pressures on the tubing was 1,950 psi. Production is through perforations at 9,522-29½ ft. The new pay opener is located in the David Kokernut Survey, Abstract 60.

A southwest extension to the new Nona Mills field, Hardin County, has been completed at the General Crude Oil Co. 2 Kirby Lumber Co. Through perforations at 8,270-76 ft., the well flowed 217 bbl. of 36.6°-gravity oil daily, with tubing pressure 275 psi. The new extension is located in the H. G. King Survey, Abstract 818, 2 miles southwest of Kountze townsite, and 1 mile southwest of the 2 Nona Mills, which is the nearest production.

Superior Oil Co. is running electrical log in its Montgomery County wildcat, 1 L. N. Kramer et al. Hole is bottomed at 11,377 ft. Operators ran a drill-stem test at 10,905-25 ft., and the well flowed an estimated 3,700,000 cu. ft. of gas daily and recovered 600 ft. of 46.2° distillate. The wildcat is located in the Edward Taylor Survey, Abstract 554, 2 miles southeast of Magnolia townsite.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Harris County: New pay at Goose Creek—Production Service Oil Corp. et al 1 Tavary, Harvey Whiting Sur., Lot 9, Pelly acres, City of Baytown, TD 5,207 ft., top pay 4,258 ft., perf. 4,258-68 ft., IP: 81 bbl. oil per day, 7/64-in. choke, TP 1,125 psi., 21.2° gravity.

Liberty County: New gas discovery—William Herbert Hunt Trust Estate 1 Mrs. M. P. Ebie, GC&SF RR Sur. 17, A-456, 8 mi. SE of Raywood, TD 8,052 ft., top pay 7,930 ft., perf. 7,930-38 ft., IP: 42,000,000 cu. ft. of gas, open flow, SIP 2,946 psi.

Live Oak County: Gas discovery—S. H.

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Howell 1 Joe Doubrava, Refugio County School Land Sur., A-399, 10 mi. SW of Tynan, TD 4,497 ft., perf. 3,959-65 ft., IP: 130,000,000 cu. ft. of gas, open flow, SIP 1,568 psi.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Calhoun County: John W. Mecom 7 Minnie S. Welder, Agaton Sisneros Sur., A-36, 3½ mi. SW of Bloomington, dry, TD 6,515 ft.

Galveston County: John W. Mecon 1 Houston Farms Development Co., Green's Lake area, Daniel Buckley Sur. 27, 10 mi. SE of Alta Loma, dry, TD 7,930 ft.

Live Oak County: Henderson Coquat and Stanolind Oil & Gas Co. 1 Mrs. Clara Briam, Dennis McGowen Sur., A-29, 2¼ mi. SE of Oakville, dry, TD 8,520 ft.

Wharton County: Kirby Petroleum Co. 1 Mrs. Nora Dagley, N flank of Boling dome, S. F. Austin League, dry, TD 1,750 ft.

Wilson County: H. H. Weinert 1 J. H. Bauman, Francisco Herrera Sur., 18 mi. SW of Seguin, dry, TD 1,000 ft.

Michigan

Kent County Wildcat Gets Pay Near Rockford Field

MOUNT PLEASANT. — McClanahan Oil Co. and W. S. Temples 1 Post, SW SW NE 35-9n-11w, Algoma Township, Kent County, was flowing oil on initial tests after acid treatment with 1,000 gal. to a hole full of oil in the Traverse at 2,342 ft., total depth. Top of Traverse lime was picked at 2,334 ft. and pays showed at 2,337 and 2,340-42 ft.

Well filled 1,500 ft. with oil first 14 hours and carried a hole full of oil when acidization was started the next morning. Pay acidized in 18 minutes, taking the shot on a vacuum. After swab was run three times in the tubing, reaching bottom only once, well started to flow at the rate of 20 bbl. of oil an hour. At the end of 5 hours a total of 42 bbl. of net oil had been recovered.

The wildcat is located about ½ mile due west of the nearest Traverse producer in Rockford field, but is virtually cut off from connecting with this older field by a ring of dry holes. The new well is also about 2 ft. higer structurally than any producer in the developed field. Typical of producers in the field to the east, the 1 Post was showing about a 10 per cent water cut.

The strike, and a 600-acre drilling block surrounding the new producer, is owned jointly, 50-50, by McClanahan Oil Co. and Temples. Operators announced a new location for immediate drilling, the NE NW SE 35-9n-11w, diagonal southwest 20-acre offset.

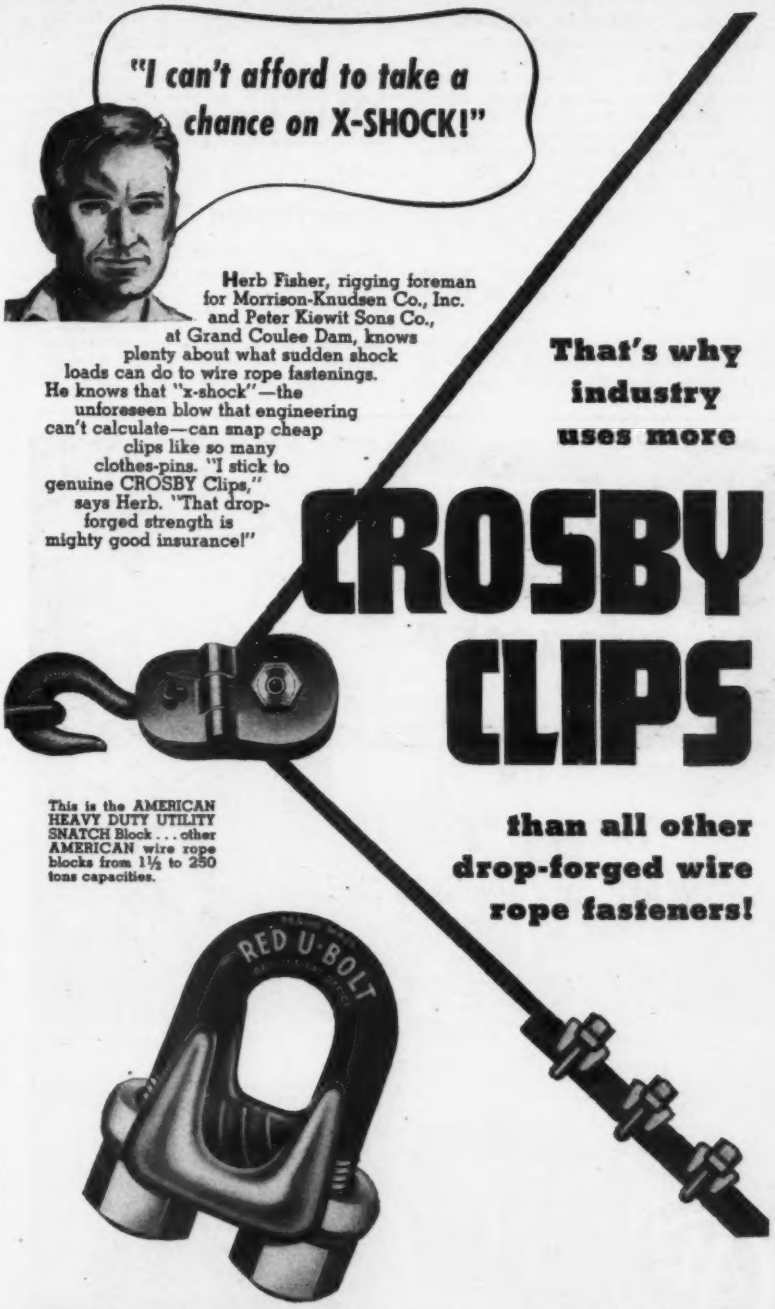
Brazos Oil & Gas Co. reported an estimated 7 to 8 million cu. ft. gas flow from the Traverse at the F-2 State-Norwich, NW SE SW 6-24n-6w, Norwich Township, Missaukee County, after gun perforation and acid treatment in the Traverse at 3,000 ft., total depth. Traverse lime was logged at 2,769 ft. and Traverse section was perforated with 80 shots at 2,970-90 ft. Wildcat is located just over 1 mile southeast of same company's Traverse gas discovery in Pioneer Township, Missaukee County.

Gas in the discovery well started to show after perforations at a point 26 ft. below the Traverse top while in the F-2. First perforations were made 201 ft. from the top of the objective.

MICHIGAN SUCCESSFUL WILDCATS

Allegan County, Lee Township: George F. Lister 1 Laraway, SW NE SW 7-1n-15, Traverse 1,200 ft., 12 bbl., TD 1,205 ft.

Bay County, Gibson Township: Ervin Major 1 Nichols, SE SE SE 2-18n-3e, Traverse 2,012 ft., 12 bbl., TD 2,145 ft., PB to 2,051 ft.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MICHIGAN WILDCAT FAILURES

Allegan County, Casco Township: Del Fortney 1 Wark, SE NE NW 4-1n-16w, Traverse 1,175 ft., dry, TD 1,193 ft.

Casco Township: George L. Lister 1 Dailey, NE SE SE 12-1n-16w, Traverse 1,185 ft., dry, TD 1,191 ft.

Wayland Township: B. W. Yasdick, Trustee 1 Berger, SW NE NW 21-3n-11w, Traverse 1,825 ft., dry, TD 1,849 ft.

Manistee County, Pleasanton Township: Mercer Oil Co., Inc., 1 Wallace, SW SW SW 1-24n-15w, Traverse 1,271 ft., dry, TD 1,300 ft.

Oceana County, Weare Township: Mercer Oil Co., Inc. 1 Schlee, NW NE SE 15-16n-17w, Monroe 2,225 ft., dry, TD 2,286 ft.

Van Buren County, Almena Township: Arthur J. Gilmore 1 Rhodes, NE NE NE 13-2s-13w, Traverse 1,348 ft., dry, TD 1,388 ft.

Columbia Township: Harris Oil Co. 1 Huberty, NE NW SE 27-1s-15w, Traverse 1,121 ft., dry, TD 1,157 ft.

Ohio Fields

Clinton Sand Strikes Get Good Oil and Gas Shows

COLUMBUS.—Frank Brendel Oil & Gas Co. 3 J. Ashcraft, Section 7, Jackson Township, Muskingum County, shot a good showing of oil in Clinton, found at 3,152-3,200 ft. and flowed 110 bbl. in the first 24 hours. In the same township, Waverly Oil Co. 2 F. Phillips, Section 6, made 46 bbl. the first day after shot from Clinton at 3,088-3,151 ft.

Oxford Oil Co. 5 Glen Pletcher, Section 36W, York Township, Morgan County, topped the Clinton at 3,812 ft. and finished in sand at 3,820 ft. with a natural open flow of 1,332,000 cu. ft., and a rock pressure of 900 psi. This well when drilled deeper has good prospects for oil production in the bottom of the Clinton, and gas in the Medina horizon.

Ray Penick et al 1 L. V. Shrider, Section 5, Hopewell Township, Perry County, a ½-mile northeast stepout, is testing an oil showing in the Clinton sand found at 2,660-92 ft.

M. B. Belden Co. 2 Fred Davis, Section 13, Bethlehem Township, Stark County, shot gas pays in both the red and white Clinton sands, and was shut in at 430,000 cu. ft. with 1,300 psi. pressure. The Clinton was logged at 4,584-4,662 ft.

Felix Gerst et al 1 G. M. Eichorn, Section 34, Jefferson Township, Noble County, picked up a stray sand at 990 ft. with an open flow of 1,250,000 cu. ft., natural.

Perry County led in new locations for the week with 6 out of a total of 19, and was followed by Summit with 4. Ashland field led in completions with 7 out of 25.

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South Louisiana

Napoleonville Dome Gets Production on North Flank

NEW ORLEANS.—New pay has been opened on the north flank of Napoleonville dome, Assumption Parish, at Thomas Jordan, Inc. 1 Kessler-Sternfels, 33-12s-13e. The well gaged 2,000,000 cu. ft. of gas per day plus 70 bbl. of 50°-gravity condensate through perforations at 8,820-36 ft. Two other sands were reported for the well above the producing zone, and apparently were gas sands. One was a 60-ft. sand at 8,580-8,640 ft. Production on the Napoleonville dome has heretofore been confined to the northwest and southwest flanks.

Potential gage of 115 bbl. of oil per day was reported on the Sinclair Oil & Gas Co. 1 H. M. Kimbell, new discovery well in Pointe Coupee Parish, 20-6s-10e. Flow was gaged through a 5/32-in. choke through perforations at 9,205-07 ft. Tubing pressure was 875 psi. and gravity was 42.5°. The new pool opener is 8 miles north of Rosedale field in Iberville Parish.

Southern Six Drilling Co. has completed the 1 Martin Pousson for a new pay in Iota field, 24-8s-2w, Acadia Parish. The well came in through perforations at 9,554½-74½ ft. While cleaning gas and condensate through an 11/64-in. choke, under 3,300 psi. tubing pressure, the well blew out at 9,589 ft. in the original hole. Operators brought the well under control, and sidetracked at 4,990 ft. to go around the stuck drill pipe. The new hole was drilled to a depth of 9,500 ft. and a string of 7-in. casing was set to that depth for protection before coring into the new pap zone. After reaching a depth of 9,598 ft. in the sidetracked hole, 5-in. liner was run to the bottom and perforated for completion.

Magnolia Petroleum Co. is running production test in its 1 Alice B. Bozas, potential pool opener in St. Landry Parish. Well was drilled to a depth of 14,000 ft., and then plugged back to 13,112 ft. Drill-stem test is being run at 12,985-13,003 ft. The new discovery prospect is 2 miles east-northeast of Opelousas, 41-6s-4e.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

Pointe Coupee Parish: New oil discovery—Sinclair Oil & Gas Co. 1 H. M. Kimbell, 20-6s-10e, 8 mi. N of Rosedale, TD 11,200 ft., top pay 9,205 ft., perf. 9,205-07 ft., IP: 115 bbl. oil per day, 5/32-in. choke, TP 875 psi., 42.5° gravity.

SOUTH LOUISIANA WILDCAT FAILURE

Cameron Parish: Magnolia Petroleum Co. 50 Cameron Meadows, 4-15s-13w, 2 mi. S of Cameron Meadows production, dry, TD 11,796 ft.

Canadian Fields

Wildcat Taps Crude Oil Below Natural Gas Pay

CALGARY.—The Whitelaw wildcat in northwest Alberta that last week rated as a natural-gas strike has now shown as an oil discovery with 24°-gravity crude oil. Shell Oil Co. and British American Oil Co. 1 Whitelaw in LSD 2, 14-82-2w6, is about 36 miles northwest of Imperial's Normandville Devonian oil discovery. Source of the oil is a sand at 3,860-3,905 ft., a zone of unspecified age overlying the Madison and Devonian sections still to be tested by the wildcat.

Oil was first reported in a 90-minute drill-stem test of the interval 3,855-3,905 ft. During the test gas volume was less than 10,000 cu. ft. per day. When pipe was pulled it was found to contain 2,970 ft. of dark brown gassy oil plus 60 ft. of mud. A 135-minute test was made from 3,860-3,905 ft., with gas volume still under 10,000 cu. ft. daily, while pipe recovery was 3,350 ft. of oil and 30 ft. of oil-cut mud. No formation water was shown. Further testing is now being carried out at the same depth.

Before oil was found, the Whitelaw well chalked up a highly promising gas discovery through a 500-ft. sand section between 3,300-3,833 ft. levels. The biggest flow on a single test of part of this section gave gas at a rate exceeding 7,000,000 cu. ft. daily.

North Woodbend 1, extension effort being drilled by Imperial, Anglo Canadian Oil Co., Home Oil Co., and the Calgary & Edmonton Corp., has logged oil in the Lower Cretaceous and hole is now in the D2 zone of the Devonian where testing is being carried out. The prospect, a mile north of Woodbend Devonian production, is nearly 5 miles northwest of Gibbons Cretaceous pool which lies east of Leduc-Woodbend field.

A well showing more promise for the southeast extension area of Leduc, opened up by Leduc Calmar 2 (D2 oil well), again received a substantial recovery of oil during another test of the D2 zone. The well, Leduc Calmar-P.C.M.-Inland Empire 1, in LSD 2, 25-49-26w4, ran the latest test of D2 interval at 5,260-70 ft. and received a natural gas flow rate of 310,000 cu. ft. daily, decreasing to nothing as oil entered the pipe. Pipe recovery during the 1-hour test was 4,140 ft. of oil, with no sign of water. A previous test at 5,260 ft. gave a flow of oil to the surface in 61 minutes. Crew is now running production string of casing and completing the well.

Twenty additional Alberta wells were completed this week, 16 resulting as oil producers, 1 as a gas well, and 3 failures. The province's score of completions from the first of this year to June 9 now stands at 336, including 251 oil wells, 10 gas wells, and 75 dry holes.

The Redwater oil field again led the list during the past week, with nine completions, all successful oil producers. Imperial Oil, Ltd., accounted for five of the producers; the Federated-General Petroleums & Associates team, two oil wells; the McMahon-Schermerhorn group from Tulsa, and Canadian Gulf Oil Co. each completed one oil producer.

Four oil wells were placed on steady production in Leduc field, two owned by Imperial, and one each by Continental Oil Co. of Canada (on a Globe Oil-Leduc West quarter section) and Bay Petroleum Corp.

At Excelsior, Imperial completed two wells, one oil well and the other dry. British Empire Oil Developments, Ltd., placed its second Stettler oil well on pro-

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duction, while Holly Petroleums, Ltd., completed a Lloydminster well.

The lone gas well was drilled in the huge Viking-Kinsella gas field by Northwestern Utilities, Ltd.

Two wildcat tests completed dry: Rio Bravo Crown 15-28, LSD 15, 28-36-17w4, TD 4,807 ft. Imperial Tangent 1, LSD 13, 18-80-23w5, TD 7,398 ft.

Permian Basin

New Pool Confirmation Well Continues Tests After Flow

MIDLAND.—Sun Oil Co. 1 D. G. Sampson, NW NW 9-98-H&TC, confirmation well for the new Clairemont field of Kent County, flowed 119 bbl. of oil and 39 bbl. of wash water in 19 hours through ¼-in. choke. Flowing pressures were 125-525 psi. on tubing and 400-600 psi. on casing. Gas-oil ratio was 340 cu. ft. Testing continued. The well had been swabbed in and tested through various size chokes, yielding 39 bbl. of wash water and 44 bbl. of oil in 14 hours. The flow died at 14 hours. Two miles south of Hunt-Young reef field, Estill S. Heyser, Jr. 2 L. T. Lohman, 114-G-W&NW, set 7-in. casing at 6,516 ft. and was waiting on cement. It had top of the reef at 6,470 ft., on elevation of 2,127 ft. Before running pipe, a 2½-hour drill-stem test from 6,472-6,520 ft. recovered 900 ft. of heavily mud-cut oil.

Barnsdall Oil Co. has made location for 2 R. L. Spires, 467 ft. from north and 1,787 ft. from west lines, 21-4-H&GN. The 8,000-ft. test is ½ mile south of its 1 Spires, Strawn discovery at 6,757-6,860 ft.

In Borden County, Don Ameche and others 1 W. D. Johnson, SW NE 45-32-5n-T&P, 6 miles north of Good field, topped the Mississippian at 9,210 ft., which was said to be 162 ft. low to Ameche 1 Clayton & Johnson, 2½ miles to the northwest. Top of the Pennsylvanian reef was 8,320 ft. Elevation was 2,514 ft.

Nelson Bunker Hunt 1 Jerry B. Clayton, 42-32-4N-T&P, 1¼-mile outpost to Good field, topped the Ellenburger at 10,060 ft., minus datum point 7,531 ft. After setting 5-in. casing at 8,348 ft. the hole was plugged back to 8,251 ft. to test.

Aurora Gasoline Co. 1 Engle, SW NW 64-25-H&TC, was drilling ahead at 5,874 ft. The well had total depth at 6,270 ft., then plugged back to 5,874 ft. when casing parted at that depth.

In Scurry County, Skelly Oil Co. 1 Woodson, 255-97-H&TC, a 1-mile northwest extension to Kelley-Snyder field, had total depth at 6,929 ft. After electrical surveys had been run, casing was set at 6,929 ft. According to reports, the well had some 175 ft. of reef, with about 88 ft. of effective pay.

Geier-Jackson 1 Feldman-Pardo, 703-97-H&TC, west stepout to Cogdell field, had top of the reef at 7,010 ft., minus 4,454 ft., and was to run electrical surveys. Total depth was 7,035 ft.

One-half mile south of Collins Strawn field, Herman Brown 1 Parks, 442-97-H&TC, had total depth at 7,398 ft. and was to drill ahead to 7,415 ft. A core from 7,360-80 ft. recovered 18 ft. of lime with streaks of shale and 2 ft. of crystalline lime with oil odor. A core from 7,380-98 ft. recovered 16 ft., being 2 ft. of tan lime, bleeding oil, and 14 ft. of gray lime with streaks of shale.

In northwest Mitchell County, J. W. Murchison 1 Womack, SE NW 8-26-H&TC, started unloading mud when it had a drilling break at 8,335-38 ft., but operators killed the well and regained circulation. At 8,338 ft. it was believed to be in the lower Mississippian. Drilling was to continue to the Ellenburger. On elevation of 2,272 ft., the well had Canyon lime at 7,525 ft., reef 7,693 ft., Strawn 7,980 ft., and top of the Mississippian at 8,092 ft. A drill-stem test from 8,235-75 ft. recovered salt water.

In Howard County, Shell Oil Co. 1 O'Daniel, SE SW 2-30-1N-T&P, prepared to drill ahead below 6,205 ft. A 90-minute drill-stem test from 6,170-6,205 ft., in the Wolfcamp, had gas in 15 minutes and unloaded an estimated 2 bbl. of oil after pulling 44 stands. Recovery was 360 ft. of oil, 90 ft. of oil-cut mud and 270 ft. of drilling mud, with no formation water. Location is 5 miles north of Iatan-East Howard field.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Borden County: R. E. Fair and Woodward & Co. 1 T. L. Griffin, SE SE 46-25-H&TC, dry, TD 7,800 ft., elev. 2,372 ft., reef 7,155 ft., Strawn 7,750 ft.

Coke County: Amerada Petroleum Corp. 3 March Ranch, 37-Z-D&SE, dry, TD 773 ft., in caving shale.

Gaines County: Ralph Lowe 1 H. T. Wolfe, NE NE 20-A28-PSL, 13 mi. SE Hobbs field, dry, TD 8,364 ft., elev. 3,462 ft., San Andres 4,280 ft., San Angelo 5,575 ft., Tubb sand 6,610 ft., Devonian 8,229 ft.

Lynn County: W. E. Dunigan 1 G. F. Holland, 330 ft. from N&E lines, 13-J-GWT&P, 7 mi. E, 2 mi. N Wilson, dry, TD 4,107 ft., elev. 3,044 ft., anhydrite 1,490 ft., salt 1,570 ft., San Andres 3,130 ft.

Reeves County: William A. Lanphere 1 TXL, SE SE SW 37-56-2-S-T&P, 5 mi. SE Tunstill field, dry, TD 3,765 ft., elev. 2,773 ft., Delaware lime 3,381 ft., sand 3,398 ft.

Runnels County: Norman & Swearinger 1 H. H. Henry, Sec. 444, H. L. Bays Sur., 7 mi. NW Winters, dry, TD 4,456 ft., elev. 1,980 ft., Valera 1,400 ft., Coleman Junction 1,770 ft., Noodle Creek 2,39[illegible] ft., Saddle Creek 2,670 ft., Flippen 2,77[illegible] ft., Bunger lime 3,330 ft., Home Creek 3,570 ft., Palo Pinto 3,990 ft., Capps 4,[illegible] ft., Fry sand 4,370 ft.

T. W. Murray and Ice Brothers 1 G. Clayton, NW NW SE Sec. 134, ETRR Sur., 2½ mi. NW Ogden-Mabee field, dr[illegible]

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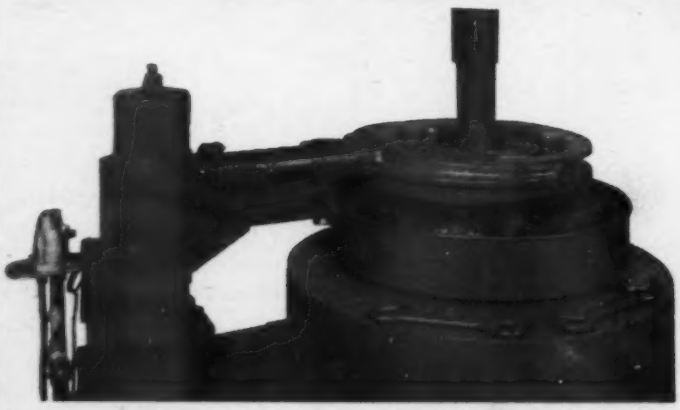

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TD 4,201 ft. in dolomite, elev. 1,879 ft., DST 3,973-84 ft. had oil-cut mud.

Robinson-Puckett, Inc. and G. W. Strake 1 Mrs. Mattie Smith, J. Hensley Sur. 83, 1 mi. NE Winters field, dry, TD 5,065 ft., elev. 1,925 ft., upper Capps 4,120 ft., Fry sand 4,214 ft., Ellenburger 4,956 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Hutchinson County: Kerr-McGee Industries 1 Coble, 1-125 ft. from N, 4,714 ft. from W lines, 22-7M-TCRR Sur., dry, TD 9,019 ft., elev. 3,016 ft., brown dolomite 3,337 ft., Moore County lime 3,542 ft. (3,650 on another report), Mississippian 8,197 ft.

SOUTHEAST NEW MEXICO

HOBBS. — Magnolia Petroleum Co. 1-B Walker, 6-9s-36e, 1½-mile northeast step-out to Bough field of Lea County, was waiting on cement after setting 7-in. casing on bottom at 10,235 ft.

Gulf Oil Corp. 1 Sams-State, 17-15s-33e, was drilling at 10,352 ft. in lime and shale. A core from 10,170-79 ft. recovered 9 ft. of limestone having scattered porosity. A drill-stem test from 10,157-79 ft., using water blanket and open 75 minutes, recovered the water cushion and 390 ft. of sulfur water. Flowing pressure was 1,150 psi.

Stanolind Oil & Gas Co. 1-B Anna Foster, SW SE 14-19s-38e, Hobbs field outpost, was drilling limestone below 6,415 ft.

In Chaves County, Apache Oil Co. 1 Noble, 18-4s-27e, was drilling below 6,947 ft. following a 30-minute drill-stem test at 6,540-6,727 ft. which recovered 20 ft. of drilling mud with no shows.

Amerada Petroleum Corp. 1-R-A State, SW SW 22-8s-32e, 12,000-ft. wildcat, was drilling at 6,840 ft.

Honolulu Oil Corp. 3 State, NE SE 13-8s-27e, east offset to discovery production, was drilling plug on 5½-in. casing set at 6,491 ft. Total depth was 6,533-53 ft.

Mississippi

Second Alabama Discovery Pumping 100 Bbl. per Day

JACKSONVILLE.—Humble Oil & Refining Co. continues to test 1 Marion Davies et al, second oil discovery in the state of Alabama. Well is bottomed at 8,093 ft. and is producing through perforations in the lower Tuscaloosa (Massive) at 5,519-29 ft. On initial 24-hour test, the well pumped 81 bbl. of 14°-gravity oil. Well was being pumped on 64-in. stroke at the rate of seven strokes per minutes. On a later test, the well was pumped on 64-in. stroke at the rate of six strokes per minute, and produced 100 bbl. of oil per day, being 3 per cent B.s. and w. Operators are now waiting on additional storage and continuing to test. The new discovery is located in 15-3n-2e, Clarke County.

Final completion has been made on Plains Production Co. 1 W. C. Walker, 11-5n-2w, Adams County, Mississippi, discovery well for the new Kingston field. On completion gage, the well flowed 54 bbl. of 42°-gravity oil per day through ⅛-in. choke. Tubing pressure was 140 psi. and casing pressure was 240 psi. Production was through perforations at 6,654-56½ ft. in the Wilcox, which was the deepest of four Wilcox sands carrying shows.

In the Sibley field area, Adams County, Mississippi, Midstates Oil Corp. 1 Ligon & Mazique, 20-5n-3w, took sidewall samples and recovered sand with shows at 5,144-45, 56, 47 ft. This is reported to be in a stray Wilcox sand that has not been tested in the area. Test is now bottomed at 6,341 ft. It is located 4,000 ft. north of Humble 1 Alberta Robinson, Sibley field discovery well.

In Pickens field, Yazoo County, Mississippi, Carter Oil Co. 1 R. M. Bridgforth,

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3-12n-3e, west offset to the Carter 1 Wilson, has run a drill-stem test at 4,833-47 ft. Using ¼-in. top and 5/16-in. bottom chokes, 210 ft. water cushion, tool was open 20 minutes with recovery being water cushion and 10 ft. of mud. Bottom-hole flowing pressure was 100 psi. The well is now drilling below 5,650 ft.

MISSISSIPPI SUCCESSFUL WILDCAT

Adams County: Plains Production Co. 1 W. C. Walker, 11-5n-2w, TD 6,804 ft., top sand 6,654 ft. Wilcox, perf. 6,654-56½ ft., IP: 54 bbl. oil per day, 42° gravity, ⅛-in. choke, TP 140 psi., CP 240 psi.

MISSISSIPPI WILDCAT FAILURES

Lawrence County: Humble Oil & Refining Co. 1 Hezakiah Summers, 19-6n-10e, dry, TD 11,165 ft.

Noxubee County: Price & Voss 1 A. J. Hadaway, 18-15n-19e, dry, TD 3,503 ft.

Kansas

Morris County Wildcat Gets Hole Full of Oil

IN the area about 4 miles northeast of Burdick pool in Morris County, Koester and Mergen 1 Burns, SW NW SW 25-16s-5e, is showing for a Mississippi producer. The Mississippi was topped at 2,207 ft. and a drill-stem test at 2,208-52 ft. had a recovery of 750 ft. of oil and mud. Casing was set at 2,208 ft. and after cleaning out operator had a hole full of fluid including only very small amount of water.

C-G Drilling Co. and D. G. Hansen have a productive wildcat in the area between Muillenburg and Morlan pools in Graham County. The well, 1 Bass, NW NW SW 12-10s-21w, was drilled to a total depth of 3,833 ft., topping the Arbuckle at 3,826 ft. After 500-gal. acid treatment, well swabbed 10 bbl. of oil per hour.

In Marion County, Raymond Gear et al. 1 Robinson, SW SW NE 31-20s-5e, topped the Viola at 2,561 ft. and found saturation at 2,563-66 ft. Casing was set at 2,558 ft. Fluid rose in the hole to a depth of 250 ft. in 10 hours. Pumping potential is 18 bbl. daily.

A second Harlan County, Nebraska, wildcat has had Lansing-Kansas City shows. Powell & Peters Drilling Co. 1 Kauk, NW NW NW 17-1n-18w, about 10 miles north of Huffstutter pool in Phillips County, Kansas, had a recovery of 2 ft. of oil and 15 ft. of oil-cut mud on a 25-minute drill-stem test at 3,428-37 ft. Lansing was topped at 3,337 ft. Another small show of oil was recorded for zone at 3,455-58 ft. Total depth is 3,595 ft. with casing set on bottom for further testing.

South and slightly east of the Kauk well, Alpine Oil & Royalty Co. and B. & R. Drilling Co. 1 Fischer, SW SW SE 33-1n-18w, swabbed at the rate of 7 bbl. of oil per hour through perforations at 3,366-75 ft. and 3,402-06 ft. Lansing was topped at 3,228 ft. The lower perforations were made first and after acid treatment, the well swabbed 3 bbl. per hour. This was raised to 7 bbl. per hour after the upper zone was perforated and treated.

The deep Meade County wildcat, Skelly Oil Co. 1 McKinney, NW N WNE 2-34s-26w, is drilling ahead in the Mississippian after getting gas, estimated at 1,804,000 cu. ft., on drill-stem test at 5,750-5,880 ft.

KANSAS SUCCESSFUL WILDCATS

Butler County: Marhenke Drilling Co. et al 1 Doyle, NE NE W 13-29s-4e, elev. 1,284 ft., pumped 40 bbl. of oil per day from Bartlesville at 2,812-29 ft., TD 2,830 ft.

Stafford County: Petroleum, Inc. 1 Keller "B," SE NE SW 29-21s-13w, elev. 1,908 ft., pumped 42 bbl. of oil per day from Arbuckle at 3,748-50 ft., TD 3,782 ft.

KANSAS WILDCAT FAILURES

Barton County: Amerada Petroleum Corp. et al 1 Lang, NW NW NE 4-17s-12w, elev. 1,862 ft., dry, TD 3,377 ft., Heeb-

ner 2,966 ft., lime 3,055 ft., Lansing 3,073 ft., conglomerate 3,325 ft., Arbuckle 3,346 ft.

Brack 1 Fisher, NW NW SW 31-20s-11w, elev. 1,817 ft., dry, TD 3,485 ft., Lansing 3,162 ft., conglomerate 3,395 ft.

Ellis County: Appleman 1 Ginther, SW SW SE 7-11s-19w, elev. 2,128 ft., dry, TD 3,738 ft., anhydrite 1,540 ft., Lansing 3,407 ft., Simpson 3,698 ft., Arbuckle 3,718 ft.

Continental Oil Co. 1 Luea, NE NE SW 5-14s-20w, elev. 2,275 ft., anhydrite 1,590 ft., Lansing 3,571 ft., conglomerate 3,862 ft.

Anschutz et al 1 Clark, NW NW NW 23-15s-17w, elev. 1,973 ft., dry, TD 3,617 ft., anhydrite 1,115 ft., Topeka 2,995 ft., Toronto 3,243 ft., Lansing 3,270 ft., Arbuckle 3,587 ft.

Reno County: B & R Drilling Co. et al 1 Morgan, NW NW SW 24-24s-4w, elev. 1,451 ft., dry, TD 4,027 ft., anhydrite 530 ft., Lansing 2,361 ft., Mississippian 3,381 ft., Hunton 3,770 ft., Sylvan 3,793 ft., Viola 3,862 ft., Simpson 3,885 ft., Arbuckle 3,976 ft.

Rice County: Vickers Petroleum Co. 2 Volkland, NW NW NW 32-18s-9w, elev. 1,723 ft., dry, TD 3,292 ft., Lansing 2,910 ft., Arbuckle 3,280 ft.

Rooks County: Lowell-Gist 1 Gassaway, NE NE NE 31-10s-18w, elev. 2,038 ft., dry, TD 3,696 ft., Lansing 3,287 ft., basal Kansas City 3,520 ft., Simpson 3,622 ft., Arbuckle 3,650 ft.

Nadel & Gussman 1 Annon, NE NE NE 27-10s-20w, elev. 2,157 ft., dry, TD 3,760 ft., Lansing 3,431 ft., Simpson 3,710 ft., Arbuckle 3,278 ft.

Russell County: Doley Oil Co. et al 1 Scheck, SW NW NE 8-13s-15w, elev. 1,862 ft., dry, TD 3,364 ft., anhydrite 945 ft., Lansing 3,035 ft., Arbuckle 3,340 ft.

Stafford County: Petroleum, Inc. 1 Matzer, SW NE SW 35-21s-14w, elev. 1,936 ft., dry, TD 3,825 ft., Lansing 3,422 ft., Arbuckle 3,794 ft.

Lindas et al 1 Neill, SE SE NE 12-24s-14w, elev. 1,913 ft., dry, TD 4,180 ft., anhydrite 830 ft., Lansing 3,574 ft., Viola 3,974 ft., Simpson 4,095 ft., Arbuckle 4,145 ft.

Thomas County: Kelly & Weissbeck 1 Thomas, NE NE NW 30-7s-32w, elev. 3,110 ft., dry, TD 5,261 ft., Dakota 1,690 ft., anhydrite 2,787 ft., Topeka 3,839 ft., Lansing 4,120 ft., basal Kansas City 4,418 ft., Mississippian 4,737 ft., Arbuckle 4,884 ft.

Wabaunsee County: Abercrombie 1 Lockhart, NW SW NW 12-14s-10e, elev. 1,416 ft., dry, TD 3,515 ft., Lansing 1,566 ft., Kansas City 1,725 ft., Mississippi chert 2,581 ft., Hunton 3,095 ft., Viola 3,292 ft., Simpson 3,400 ft., Arbuckle 3,475 ft.

Illinois-Ind.-Ky.

Pike County Indiana, Has Prospective Pool Opener

THE area in the southwestern part of Pike County, Indiana, has a good prospective pool opener at Ryan & Sharp 3 Enos Coal Co., SW SE SE 4-3s-8w, where operator is cleaning out and testing Cypress pay at 1,368-80 ft. The well had gas in 7 minutes and a recovery of 550 ft. of clean oil and 100 ft. of oil-cut mud on a 35-minute drill-stem test. When plug was drilled, hole filled 250 ft. with oil and mud within 15 minutes. The well is about 4 miles east of Summerville. Ryan & Sharp 1 Enos Coal Co., about 4 miles to the southeast, was dry.

In Henderson County, Kentucky, and about 2 miles southwest of Spottsville pool, R. E. Hupp, C. E. Skiles et al 1 Crafton-Basket, NE NE 4-P-25, appears to be a McClosky pool opener. On drill-stem test, the well had gas in 5 minutes and flowed clean oil in 42 minutes. The well also had a show of oil on a test of the Cypress at 1,934-82 ft. and a recovery of 90 ft. of oil-cut mud on a 1-hour drill-stem test of the Aux Vases at 2,078-2,118 ft. Top of the Ste. Genevieve was called at 2,128 ft. and the McClosky test was at 2,225-36 ft.

The wildcat in Todd County, Kentucky, W. H. Ware and Haley 2 Kennedy, near C SW, 5-C-29, has been completed in the Devonian at 1,206-09 ft., pumping 86 bbl. daily. This is the first commercial production in the area.

In Franklin County, Illinois, Columbus Exploration Co. 1 Alva Cook, Jr., SE SE SW 21-5s-3e, has been completed as a McClosky producer with pay at 2,916-21 ft. and 2,928-45 ft. The well either opens a new pool or is a half-mile extension of Whittington pool to the east.

In the area about a mile southeast of production in Bennington pool in Edwards County, Illinois, A. J. Slagter, Jr. 1 J. A. Kunust, SW NE SW 20-1n-10e, has been completed in the O'Hara pumping 240 bbl. daily from pay at 3,233-39 ft.

Another Illinois wildcat has been completed as a good producer. Calvert Drilling Co. 1 C. L. Jordan, NW NE NE 25-3n-10e, Richland County, and about 4½ miles

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southeast of Olney, was completed in the McClosky at 3,184-88 ft. and 3,198-3,209 ft. with initial production of 840 bbl. daily through 2-in. tubing.

Watkins Drilling Co. 1 Homer Redd, SE NE SE 26-1s-6e, Wayne County, Illinois, is testing McClosky pay at 3,226-35 ft. and is reported to have swabbed at the rate of 5 bbl. per hour after acid treatment.

ILLINOIS SUCCESSFUL WILDCATS

Fayette County: R. Halbert et al., 1 Reese, SE SW SW 18-6n-3e, IP 12 bbl., sand 1,602-10 ft., TD 1,792 ft., PB 1,617 ft.

Richland County: Calvert Drilling Co. 1 Jordan, NW NE NE 25-3n-10e, IP flowed 991 bbl., Rosiclare 3,198-3,209 ft., TD 3,210 ft.

Saline County: Ryan Oil Co. 1 L. T. Stinsen, SE NE NW 17-8s-7e, IP 12 bbl., Palestine 1,942-47 ft., TD 1,950 ft.

ILLINOIS WILDCAT FAILURES

Clay County: Magnolia Petroleum Co. 1 Lewis, NE NE SE 32-5n-5e, dry, TD 2,676 ft.

Ryan Oil Co. 1 T. J. Murvin, SW SW NE 21-5n-7e, dry, TD 2,972 ft.

George & Wrather 1 E. Dow, NW SE SE 28-4n-5e, dry, TD 2,817 ft.

Edgar County: J. H. Gano 1 Hull, SE SW SW 35-16n-13w, dry, TD 1,040 ft.

W. J. Reese 1 C. W. Rowe, SE SE SE 12-14n-11w, dry, TD 797 ft.

Gallatin County: Gilliam Drilling Co. 1 Decker, SW SE NW 21-7s-10e, dry, TD 2,965 ft.

Jasper County: Sanders & Fry 1 Birk, SW NW SW 15-5n-9e, dry, TD 3,148 ft.

Herchenroeder et al., 1 C. W. and A. K. Yunk, SE SE SE 21-5n-10e, dry, TD 2,969 ft.

Richland County: McGaw & Hughes 1 Beauleau, NE SE SE 13-3n-14w, dry, TD 2,988 ft.

Shelby County: H. L. Luttrell et al., 1 Moomaw, NW SW NE 34-10n-5e, dry, TD 2,146 ft.

Wabash County: J. M. Zantis 1 Groff, NW SW SW 31-1n-13w, dry, TD 2,860 ft.

Wayne County: Aurora Gasoline Co. et al., 1 S. Spitler heirs, NE SW SE 3-1s-9e, dry, TD 3,402 ft.

White County: B. M. Heath 1 Zummerman, NW SE SE 9-5s-9e, dry, TD 3,401 ft.

INDIANA SUCCESSFUL WILDCATS

Knox County: Aurora Gasoline Co. et al., 1 Wells, NW SE NW Don 165-2n-9w, IP 10 bbl., Aux Vases 1,536-52 ft., TD 1,940 ft. (Discovery well for Monroe City, West.)

Pike County: Wabash Petroleum Co. 4 E. Couts, NW SW SE 30-1n-9w, IP 10 bbl., Osage 2,327-33 ft., TD 2,335 ft.

INDIANA WILDCAT FAILURES

Daviess County: Lawrence & McGee 1 Estelle Long, NW NE SE 24-4n-7w, dry, TD 980 ft.

Dubois County: Patoka Drilling Co. 1 L. Hohler, SE SW SE 24-2s-5w, dry, TD 1,150 ft.

Gibson County: George & Wrather 1 H. Crabtree, NW NE SE 25-3s-13w, dry TD 2,843 ft.

Knox County: Hayes and Big Four Oil & Gas Co. 1 O. Klein, NW NW SE 4-1n-11w, dry, TD 2,109 ft.

Posey County: Skiles Oil Co. 1 H. Slow, NW SW NW 24-7s-12w, dry, TD 2,658 ft.

Vanderburgh County: Calvert Drilling Co. and Hohland Oil & Refining Co. 1 Helen Murphy, SE NW SW 30-5s-10w, dry, TD 1,135 ft.

Ashland Oil & Refining Co. and Buchman & O'Neal 1 J. A. Kercher, NW SW SE 7-7s-11w, dry, TD 2,648 ft.

Warrick County: Joe Reznik 1 R. L. Scholl, NE NE SW 15-4s-9w, dry, TD 2,055 ft.

EASTERN KENTUCKY

ASHLAND.—In Knox County and on the Waters of Georges branch of Stinking Creek, Triangle Oil & Gas Co. is preparing to shoot a good show of oil in Corniferous lime from 3,065 to 3,102 ft. Well is located on John W. Croley, and top of Corniferous was had at 3,140 ft. with total depth 3,162 ft. Previously a good show of

oil was had in the Maxon sand from 2,165 to 2,190 ft. and will probably also be tested.

In Big Sandy gas field, United Fuel Gas Co. has recently completed the following wells: 2 Amanda Charles, Pike County, for 118,000 cu. ft. of gas daily from Big lime and Devonian shale at a total depth of 3,944 ft.; 2 Annie E. Young, Pike County, for 158,000 cu. ft. gas daily from Devonian shale at total depth of 3,654 ft. Both wells were shot with 5,100 lb. of gelatin.

In Cumberland County, 9-C-50 Collie Ellis et al 1 Merley is still shut down for orders at 2,300 ft. No tops have as yet been released on this key wildcat but it is understood that operators have hole full of water presumably from the Knox formation.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

Henderson County: Delta Drilling Co. 1 A. B. Elban, NW SE SW 6-O-23, IP 8 bbl., Waltersburg 1,778-88 ft., TD 1,790 ft.

Oklahoma

South Ceres and Northeast Longview May Be Linked

COMPLETION of Howell & Howell and Walter Duncan 1 Jirious, SW SW SW 31-24n-1e, Noble County, will add to the possibility that South Ceres and Northeast Longview are connected. The Jirious well had Burbank sand at 4,302-68 ft. and made better than 110 bbl. in the first 3 hours through 12/64-in. choke. The well is about half way between activity at the northern tip of South Ceres and the small Northeast Longview pool.

Wilcox Oil Co. will drill deeper at its Beckham County wildcat, 1 Dugger, C NW SE 12-10n-23w, after going to 11,063 ft. and plugging back to 10,500 ft. for testing. On a recent drill-stem test at 11,024-35 ft. the well had a recovery of 350 ft. of oil and 10,000 ft. of salt water.

Activity in Lincoln County continues with the completion of Hubbell & Webb 1 Townsend, SW NW SW 33-14n-6e, making 85 bbl. daily from the Prue, topped at 3,084 ft. This is the east offset to the Prue discovery, Creekmore-Rooney 1 James which made 40 bbl. daily. Hubbell & Webb 1 Breeding, one location south of the Townsend well, has set casing at 3,077 ft. and same operators have staked location for 2 Townsend, one location north. Sinclair Oil & Gas Co. 1 Evans Co., north offset to the discovery well, is drilling below 1,600 ft.

In the area east of Sparks, Lincoln County, another Prue discovery has been completed. J. R. McLean et al 1 North, SW NE NW 9-13n-5e, was completed in the Prue at 3,508-24 ft., flowing 240 bbl. of oil and 2,000,000 cu. ft. of gas daily.

The Osage County discovery, Charles W. Oliphant 1 Osage, NE SW SE 2-25n-3e, is averaging about 150 bbl. daily from Layton sand at 2,598-2,616 ft. Pay was treated with hydrafac.

OKLAHOMA SUCCESSFUL WILDCATS

Garvin County: Extension to SW Maysville—dual completion, Anderson & Phillips 1 Rill, C NE NW 34-4n-3w, elev. 1,083 ft., flowed 125 bbl. of distillate per day from Hartshorne sand topped at 7,116 ft., flowed 137 bbl. of 42°-gravity oil per day from Gibson sand topped at 7,012 ft., TD 7,331 ft.

Lincoln County: New pay in Happy Valley—Comail 1-A Haskins, SW SW SW 19-17n-6e, flowed 5 bbl. of 40°-gravity oil per day from Prue sand at 2,939-59 ft., TD 3,400 ft., old well worker over.

Noble County: New pay in Lucien—Bay Petroleum 1 Ferguson, N/2 NW SW 34-20n-2w, elev. 1,098 ft., flowed 60 bbl. of 39.2°-gravity oil per day from Perry sand at 3,611-28 ft.

Okfuskee County, Morse district: Lottis 1 Kenneda unit, NE NE SE 14-12n-9e, flowed 35 bbl. of oil per day from Gilcrease sand at 3,048-57 ft., TD 3,705 ft., old well worked over.

Herndon Drilling Co. 1 Harjo, NE NE SE 27-12n-9e, elev. 845 ft., flowed 35 bbl. of 42°-gravity oil per day from Cromwell sand topped at 3,238 ft., TD 3,275 ft.

OKLAHOMA WILDCAT FAILURES

Beckham County: Devine 1 Newton, NE SW NE 34-9n-25w, elev. 2,011 ft., dry, TD 3,051 ft., granite wash 2,512 ft.

Comanche County: McLennan 1 Higgerson, SW SW NW 19-1n-10w, dry, TD 854 ft.

Cotton County: Norman & Graham 1 Smith, SE SE SE 28-2s-10w, elev. 1,020 ft., dry, TD 4,015 ft., Megargel 2,582 ft., Canyon 3,420 ft.

Ce-Beth Oil Co. 1 Martin, NE NW NE 21-3s-12w, dry, TD 2,003 ft.

Johnston & Ronsel 1 Woodall, SW NE NE 20-3s-13w, dry, TD 2,100 ft.

Yett 1 Goodwin, SE SW SW 12-4s-13w, dry, TD 2,276 ft.

Creek County: Martgen 1 Allen, SE SE SE 36-16s-9e, elev. 728 ft., dry, TD 3,372 ft., Bartlesville 2,520 ft., Mississippian 3,120 ft., Woodford 3,285 ft., Viola 3,312 ft., Wilcox 3,361 ft.

Grady County: Phillips Petroleum Co. 1 Nichols, C NE NE 3-4n-8w, elev. 1,199 ft., dry, TD 10,150 ft., Hoxbar 3,397 ft., Deese 5,152 ft., Dornick Hills 7,817 ft., Springer 9,710 ft.

Grant County: Marston et al., 1 Biggs, SW SW NE 8-26n-5w, elev. 1,097 ft., dry, TD 5,812 ft., Pawhuska 2,414 ft., Oread 3,169 ft., Tonkawa 3,802 ft., Layton 4,225 ft., Checkerboard 4,506 ft., Big lime 4,635 ft., Oswego 4,688 ft., Mississippian 5,069 ft., Woodford 5,629 ft., Wilcox 5,745 ft.

Kingfisher County: Lynch et al., 1 Gasaway, SW SW NW 8-16n-6w, elev. 1,099 ft., dry, TD 7,820 ft., Pawhuska 3,719 ft., Oread 4,456 ft., Dewey 5,077 ft., upper Layton 5,816 ft., lower Layton 5,979 ft., Check-

(Continued on page 183)

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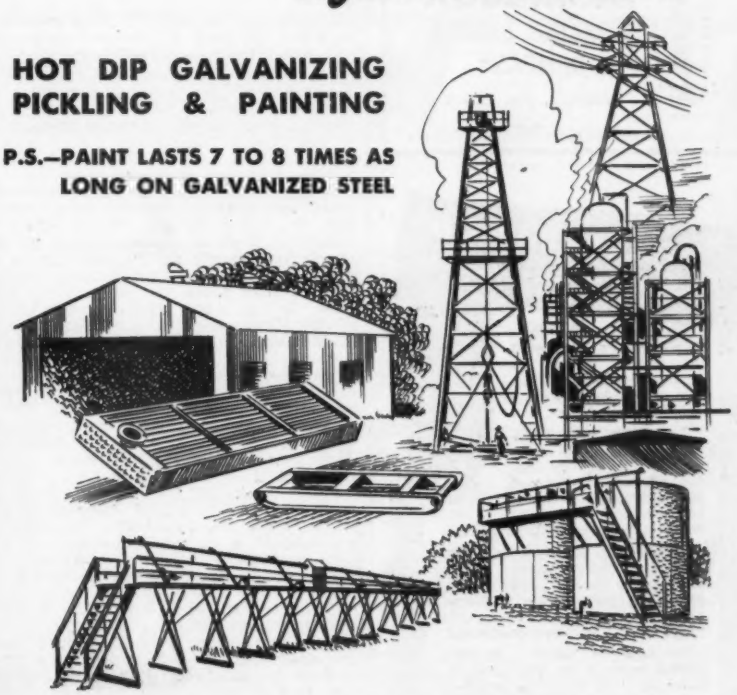

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North Central Texas

Jack County Well Finds Caddo Pay

WICHITA FALLS.—Hanlon-Boyle, Inc. 1 Laura Norman, S. R. Holly Survey, A-1,748, 2 miles south of Bryson field in Jack County, completed as a small Caddo pumping well from pay at 4,040-80 ft. Following acid treatment with 5,000 gal., the well made completion potential of 13½ bbl. of 42°-gravity oil a day, Gas-oil ratio was 220 cu. ft. Total depth was 4,440 ft., plugged back to 4,080 ft.

Seven miles south of Post Oak, Mid-Continent Petroleum Corp. set whipstock at 4,800 ft., and was drilling ahead at 4,805 ft. at its 1 John W. Campbell "A," SFIW Survey, A-555.

In Worsham-Steed field, 9 miles southeast of Jacksboro, Cherryhomes, Wood & Duerson 3 Ina E. Wimberly, James Powell Survey, A-475, completed from conglomerate pay at 4,553-91 ft. On 6-hour potential test, flowing through ½-in. choke, the well gaged 204.33 bbl. of 41°-gravity oil, with gas-oil ratio of 420 cu. ft. Flowing pressures were 420 psi. on casing and 130 psi. on tubing.

New work in Jack County included Daniel Oil Co. 1 L. Anderson, proposed 4,600-ft. wildcat to be 2½ miles west of Joplin and 2 miles southeast of Worsham-Steed field. Location is 1,108 ft. from northwest and 469 ft. from southwest lines of the E. Merando Survey, A-119, ¾ mile southwest of Russell Maguire 1 Johnston, conglomerate discovery around 4,587 ft.

In southeastern Young County, Russell Maguire and Ben Rankin 1 Pauline E. Bennett, wildcat in the Indianola Railroad Survey, A-1,271, was in the location stage at last report. The 4,900-ft. rotary wildcat will be drilled 9 miles east of Graham and 2 miles northeast of Sewell field.

A number of locations for semiwildcats have been staked, offsetting new production. In Young County, Wright, Clark & Senkel of Graham staked location for 1-F M. K. Graham Estate, 5 miles north of Murray. The 4,600-ft. project was located 2,197 ft. from north and 330 ft. from west lines, Section 2,400, TE&L Survey, which is 3,000 ft. southeast of the 1-B Graham, conglomerate discovery in pay at 4,290-4,302 ft.

The Texas Co. has staked a west offset to its 1 Boedecker, Viola lime discovery at 6,800-20 ft. The second test is the 1 T. E. Boedecker "B," 660 ft. out of the northeast corner of Section 2,851, TE&L Survey, 4 miles northwest of Bowie. Contract depth was 7,000 ft.

Bluff Creek Oil Co., Nocona, filed intention to drill its 1 Buck Jameson, in the W. L. Kern Survey, A-977. The 6,500-ft. semiwildcat is ¾ mile northwest of the same company's 1 Naomi Jameson, conglomerate discovery from pay at 5,756-67 ft.

Seven miles west of Wichita Falls, Wichita County, William Herbert Hunt Trust 1 N. R. Temple, Block 13, Palo Pinto CSL Survey, was drilling below 3,127 ft. in sand and shale, on a 5,000-ft. contract. Location is 3,000 ft. northwest of Fain & McGaha 2-A Parker Heirs, new producer which flowed 336 bbl. of oil in 3 hours from lime pay at 4,021-28 ft.

Mid-Continent 1-B M. S. McBride, W. Burk Survey, southwestern Wise County wildcat, ran a 2-hour drill-stem test in conglomerate from 5,364-84 ft. Gas showed in 4 minutes, estimated at 1,250,000 cu. ft. daily, and recovery was 50 ft. of drilling mud. Bottom-hole pressure was 1,500 psi. in 20 minutes. Drilling continued below 5,450 ft. in conglomerate with streaks of shale.

Cities Service Oil Co. 1 Huffhines, wildcat in the W. Hersee Survey, A-410, 2 miles southeast of Chico, and 5 miles from Chico field, topped the Barnett shale at 6,531 ft. and was drilling ahead in shale at 6,650 ft.

A. R. Dillard 1 B. F. McKay, 1½ miles northwest of Park Springs, in extreme northwest Wise County, recovered 240 ft. of salt water on a 1-hour drill-stem test in sand at 4,943-50 ft. Operators were drilling ahead.

In Archer County, Perkins & Cullum have filed application to drill 1-D Titken, 344 ft. from west and 530 ft. from south lines, Block 12, Falls CSL Survey.

NORTH TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCAT

Wise County: Lone Star Producing Co. 1 N. L. Conley, M. Swift Sur., 4 mi. SE Chico, TD 7,395 ft., PB 6,160 ft., elev. 807 ft., Caddo 4,989 ft. pay 5,612 ft., perf. 65 shots 5,612-25 ft., acidized 1,000 gal., flowed 1,200,000 cu. ft. of gas a day, SIP 1,298 psi.

NORTH TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: E. B. Clark 1 J. M. Powell, W. M. Henry Sur., A-163, 1½ mi. NE Archer City, dry, TD 4,004 ft.

Forest Oil Corp. and Streeter Oil Co. 1 Joseph Zotoz, Lot 108, Blk. 4, Clark & Plumb, 4 mi. NW Windthorst, dry, TD 4,098 ft., recovered 210 ft. of oil on DST 3,564-70 ft., 150 ft. salt water.

G. E. Kadane & Sons 1 Mankins "C," Blk. 3, Palo Pinto CSL, A-339, 2 mi. SE Dundee, dry, TD 4,535 ft.

G. F. Lebus, Jr. and Roy F. Lebus 1 A. J. Meurer, Lot 79, Blk. 4, Clark & Plumb, 2½ mi. NE Burns-Jones field, dry, TD 3,563 ft. in shale.

Ted A. Norwood 1 Jones & Cullum, Sec. 2, SPRR Sur., A-1255, 2 mi. E Mankins, dry, TD 1,812 ft.

Konrad Sztygold 1 L. F. Wilson, Blk. 67, American Tribune New Colony Co. Subd., 8 mi. NW Scotland, dry, TD 4,555 ft., elev. 1,010 ft.

R. Clay Underwood 1 C. R. Abercrombie, Blk. 57, Harris Subd., Club Ranch, 7½ mi. W Archer City, dry, TD 1,479 ft., elev. 1,050 ft., Gunsight lime 1,373 ft.

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R. Clay Underwood 1 R. T. Kincaid, Blk. 37, Harris Subd., Club Ranch, 8½ mi. W. Archer City, dry, TD 1,501 ft., elev. 1,006 ft., Gunsight 1,407 ft.

Baylor County: Fisher W. Palmer 1 F. G. Roberts, Sec. 150, T&NO Sur., A-969, 6 mi. SE Seymour, dry, TD 1,352 ft. in shale.

Brown County: Arledge-Carrigan & Eubanks 1 F. M. Standridge, W. Hays Sur. 603, 3 mi. SW Brownwood, dry, TD 484 ft.

Clay County: C. C. Winfrey 1 V. B. Murray, BBB&C Sur., A-43, 5 mi. NE Petrolia, dry, TD 2,005 ft.

Coleman County: Dakota-Texas Co. 1 E. R. Eppler, Sec. 104, ETRR Sur., 14 mi. S Coleman, dry, TD 2,580 ft. in shale.

Westates Petroleum Corp. of Texas 1 H. A. Shaw, Blk. 119, Wade H. Bynum Sur. 272, 2 mi. SW Santa Anna, dry, TD 1,888 ft., Fry sand 1,880 ft.

Comanche County: Sohio Petroleum Co. 1 Mittie Tate, 8-2-H&TC, 4 mi. E Duster, dry, TD 3,279 ft., elev. 1,367 ft., Marble Falls 2,683 ft., Barnett 3,196 ft., Ellenburger 3,208 ft.

Cooke County: Burk Royalty Co. 1 W. J. Wyatt, L. B. Tadlock Sur., A-1027, 1½ mi. SW Woodbine, dry, TD 4,006 ft.

Fisher County: Olson Drilling Co. 1 J. A. Young, Sec. 5, Blk. R, W. E. Richardson, Sur., 2½ mi. E Royston, dry, TD 5,625 ft., elev. 1,888 ft., Dotham 2,860 ft., Noodle Creek 2,980 ft., Canyon sand 4,515 ft., second Canyon 4,642 ft., Canyon reef 5,275 ft.

Sojourner Drilling Co., Ltd., 1 W. R. Hudspeth, Blk. 23, E. Miley Sur. 219, 5 mi. NW Noodle, dry, TD 5,612 ft., elev. 1,841 ft., Valera 1,626 ft., Dotham 2,485 ft., Noodle Creek 2,578 ft., Saddle Creek 2,803 ft., coal 2,852 ft., Swastika 3,300 ft., Ellenburger 5,513 ft.

Jack County: Henry Grace Production Co. 2 D. Lindsey, J. Zimmer Sur., A-1733, 9 mi. NW Jacksboro, dry, TD 6,144 ft., conglomerate 5,238-44 ft. had some gas and distillate on DST.

Fain & McGaha 1 H. C. Moore, R. M. Murkerson Sur., A-442, 8 mi. SE Bryson, dry, TD 2,018 ft.

D. T. Richards 1 H. O. Prideaux, Sec. 1, SPRR Sur., A-581, 5 mi. SW Antelope, dry, TD 624 ft.

Jones County: Clark & Cowden Drilling Corp. 1 Riley Horton, 40-18-T&P, 1½ mi. W Noodle, dry, TD 3,069 ft. in shale.

Fain & McGaha 1 Mrs. L. C. Richardson, A. Crain Sur. 214, 12 mi. SW Anson, dry, TD 3,605 ft., base Sedwick 2,385 ft., top Dotham 2,430 ft.

P. P. Langford, Jr. 1 Mrs. Maude Fielder, Sec. 43, Orphan Asylum Lands, 8 mi. SE Anson, dry, TD 2,365 ft. in shale.

A. R. McElreath 1 J. T. Elza, 5-2-T&NO, 6 mi. SE Anson, dry, TD 2,958 ft., elev. 1,744 ft., sand 1,490 ft., Flippen 2,180-95 ft.

McCulloch County: O. M. Yoder and A. V. Taylor 1 V. R. Lohn, Sec. 98½, H&TC Sur., 24 mi. N Brady, dry, TD 2,398 ft., Ellenburger 1,652 ft.

Palo Pinto County: Woods Trucking Co. 1 Roy Hittson, 34-2-T&P, 5 mi. W Palo Pinto, dry, TD 4,610 ft., elev. 1,159 ft., Marble Falls 3,467 ft., Barnett 4,260 ft., Ellenburger 4,408 ft.

Shackelford County: Oxford Drilling Co. 2-A McMahon & Doss, Sec. 1533, TE&L Sur., 11 mi. E Albany, dry, TD 2,072 ft.

Somervell County: Noah Davis 1 H. C. Palley, John L. Marshall Sur., 3½ mi. SE Glenrose, dry, TD 375 ft. in lime.

Stephens County: G. B. Cree 2-A W. H. Green, J. E. Michamp Sur., A-110, 12 mi. NW Breckenridge, dry, TD 420 ft.

Throckmorton County: Cities Service Oil Co. and Sinclair Oil & Gas Co. 1-143 Swenson, Sec. 143, BBB&C Sur., 15 mi. NW Throckmorton, dry, TD 5,793 ft., elev. 1,442 ft., Caddo 5,014 ft., Mississippian 5,462 ft., Ellenburger 5,698 ft.

Wise County: Signal Oil & Gas Co. 1 Henry Horton, G. A. Frazier Sur., A-893, 6½ mi. NW Springtown, dry, TD 6,590 ft., elev. 921 ft.

Signal and Lone Star 1 C. J. Lamance, SW NE Sec. 29, T&P, A-842, 5 mi. SW Boyd, dry, TD 5,538 ft., elev. 854 ft.

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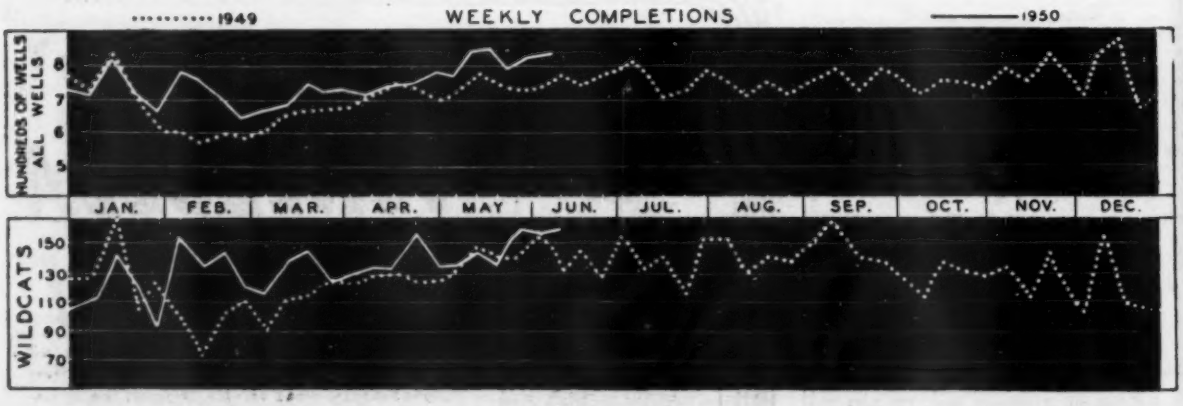
CURRENT STATISTICS

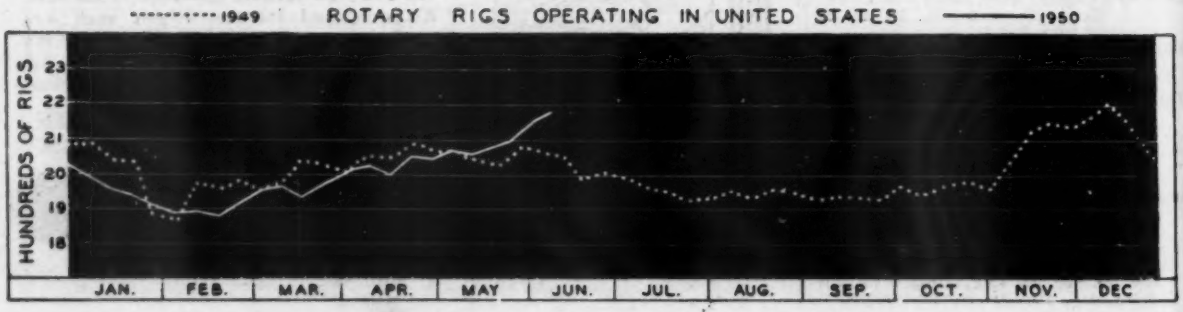
EXPLORATION

WEEKLY WELL COMPLETIONS . . . WEEK ENDED JUNE 10, 1950

	Total of all wells					June 10		Wildcat completions and discoveries									
													Cumulative total, 1950				
	Comp.	Oil	Gas	Dry	Footage	1950	1949	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	4	2	0	*2	4,848	190	564	0	0	0	0	0	0	0	0	0	0
Pennsylvania	15	5	4	†6	35,106	436	882	0	0	0	0	0	0	0	0	2	2
West Virginia	20	6	12	2	53,172	287	221	0	0	2	0	2	0	0	10	11	21
Ohio	25	7	7	*11	48,262	407	501	0	0	0	0	0	1	0	1	6	8
Indiana	43	20	0	23	79,164	574	539	2	0	0	8	10	15	0	1	108	124
Kentucky	26	17	2	7	46,006	391	382	1	0	0	0	1	7	0	1	28	36
Illinois	67	28	0	39	152,301	1,052	1,011	3	0	0	13	16	21	0	1	237	259
Michigan	14	7	0	7	22,976	339	389	2	0	0	7	9	17	0	4	113	134
Kansas	68	34	8	‡26	231,336	1,569	1,336	2	0	0	14	16	40	0	2	252	294
Nebraska	2	0	0	2	9,863	35	13	0	0	0	0	0	0	0	1	14	15
Oklahoma	134	79	8	§47	479,318	2,295	1,838	5	0	0	14	19	67	5	8	293	373
Texas	309	175	15	119	1,288,118	6,825	5,902	2	2	5	62	71	208	15	54	1,079	1,356
North Central (Dist. 7-B & 9)	112	46	3	‡63	305,668	2,127	1,871	0	0	1	32	33	85	2	14	412	513
West (Dist. 7-C & 8)	75	63	0	12	374,080	1,990	1,385	0	0	0	8	8	47	1	1	220	269
Panhandle (Dist. 10)	14	9	4	1	50,115	416	457	0	0	0	1	1	1	0	2	9	12
Eastern (Dist. 5, 6, & 6-P)	22	16	2	4	120,525	476	410	1	2	0	1	4	6	3	1	91	103
Gulf Coast (Dist. 2 & 3)	46	26	3	17	264,186	953	854	1	0	2	5	8	34	5	20	141	200
Southwest (Dist. 1 & 4)	40	15	3	22	173,544	863	925	0	0	2	15	17	33	4	16	206	259
Louisiana	33	28	0	5	216,205	1,018	891	1	0	0	2	3	26	8	4	81	119
Northern	11	10	0	1	29,388	521	458	0	0	0	1	1	4	1	1	34	40
Southern	22	18	0	4	186,817	497	433	1	0	0	1	2	22	7	3	47	79
Arkansas	6	3	0	3	15,620	159	128	0	0	0	3	3	3	0	0	38	41
Mississippi	5	3	0	2	32,159	144	166	1	0	0	2	3	8	2	0	51	61
Southeastern States	0	0	0	0	0	27	22	0	0	0	0	0	0	0	1	17	18
Montana	0	0	0	0	0	67	97	0	0	0	0	0	1	0	0	9	10
Wyoming	14	11	1	2	79,984	237	262	1	0	0	1	2	8	0	0	25	33
Colorado-Utah	3	2	1	0	12,076	29	51	0	0	0	0	0	0	0	0	21	21
New Mexico	11	9	1	1	30,352	273	251	0	0	0	0	0	9	1	0	23	33
California	33	21	1	11	125,951	748	1,173	0	0	0	6	6	10	0	2	153	165
Miscellaneous	1	0	0	1	1,235	7	14	0	0	0	1	1	0	0	0	7	7
Total United States	833	457	60	316	2,964,052	17,109	16,633	20	2	7	133	162	441	31	90	2,568	3,130
Total previous week	826	485	53	288	3,027,419	....	....	21	1	5	129	156	421	29	83	2,435	2,968
Total June 10, 1949	796	443	50	303	2,887,323	....	....	12	3	7	109	131	392	42	80	2,359	2,873

Service wells included: *2, †5, ‡1, §6.





DAILY AVERAGE PRODUCTION FOR WEEK

	June 10 crude oil	B. of M. June demand	June 3 crude oil
Alabama	1,750	1,800	1,750
Arkansas	78,900	87,000	78,350
California	870,200	850,000	857,600
Colorado	58,900	65,000	59,100
Eastern	60,800	62,000	61,750
Florida	1,500	1,200	1,100
Illinois	169,900	186,000	176,800
Indiana	31,800	28,000	29,500
Kansas	253,400	285,000	282,800
Kentucky	26,400	27,000	26,400
Louisiana	563,825	560,000	537,050
North Louisiana	119,100	.....	117,200
South Louisiana	444,725	.....	419,850
Michigan	47,100	46,000	46,400
Mississippi	98,900	103,000	100,300
Montana	23,200	25,000	22,000
Nebraska	2,000	3,000	1,500
New Mexico	126,675	144,000	126,350
Oklahoma	419,950	438,000	424,700
Texas	2,244,450	2,120,000	2,151,875
Dist. 1 (Southwest)	28,275	.....	27,750
Dist. 2 (Southwest)	132,700	.....	126,400
Dist. 4 (Southwest)	209,950	.....	200,975
Dist. 3 (Gulf Coast)	403,500	.....	387,825
Dist. 5 (Eastern)	33,925	.....	32,525
Dist. 6 (Eastern)	88,575	.....	85,075
East Texas field	282,000	.....	270,375
Dist. 7-C (West)	53,275	.....	51,950
Dist. 8 (West)	708,825	.....	669,175
Dist. 7-B (W. Central)	69,325	.....	67,950
Dist. 9 (N. Central)	141,850	.....	140,125
Dist. 10 (Panhandle)	92,250	.....	91,750
Utah	3,500	4,000	3,400
Wyoming	163,100	154,000	163,100
Total United States	*5,246,250	5,190,000	5,151,825
Change from previous week, up	94,425		
Canada	61,400	.....	60,900

Total U. S. production January 1-June 10 ..... †808,392,970 bbl.
Same period last year (crude plus cond.) ..... 839,351,965 bbl.

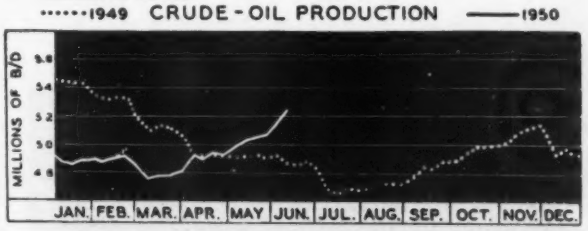
*Not incl. 103,500 bbl. condensate. †Incl. 15,595,545 bbl. condensate.

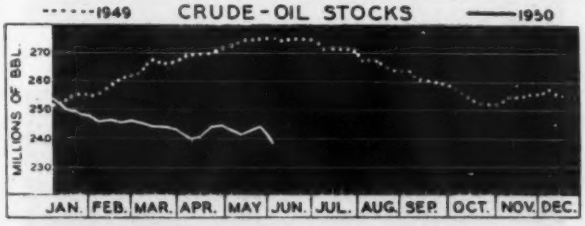
CRUDE-OIL STOCK BY STATES OF ORIGIN*

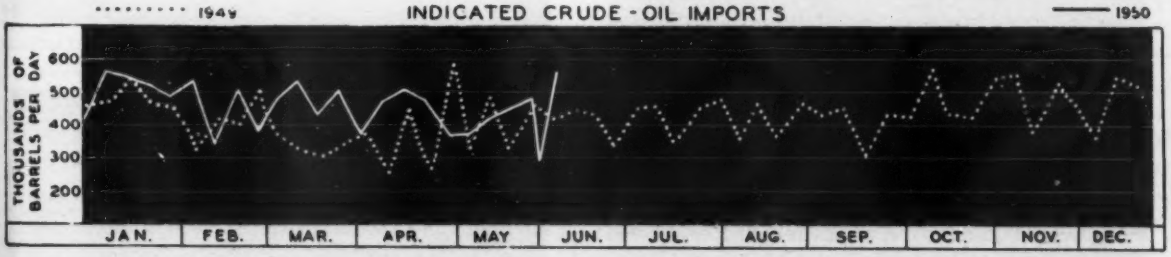
(Thousands of barrels)

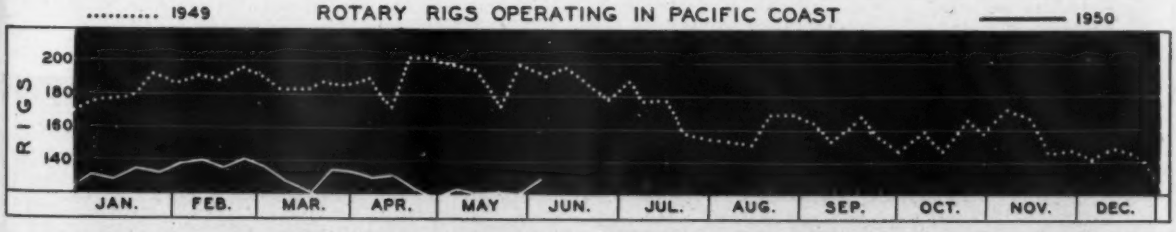
	June 3, 1950	May 27, 1950	June 4, 1949
Pennsylvania Grade	2,899	2,908	3,091
Other Appalachian	1,693	1,670	1,946
Illinois, Indiana, Michigan	8,936	8,970	14,345
Arkansas	2,838	2,875	3,089
Louisiana	14,599	14,945	14,846
North	3,683	3,817	3,168
Gulf	10,916	11,128	11,678
Mississippi	1,952	2,077	3,291
New Mexico	5,537	5,983	7,293
Oklahoma and Kansas	34,756	36,004	40,426
Texas	109,217	110,294	129,864
East Texas	15,047	15,077	17,967
West Texas	40,199	40,284	51,810
Texas Gulf	26,624	27,444	30,571
Other Texas	27,347	27,489	29,516
Rocky Mountain	13,161	13,160	13,706
California	36,683	36,661	34,950
Foreign	6,501	5,295	8,174
Total	238,772	240,842	275,021

*Bureau of Mines.







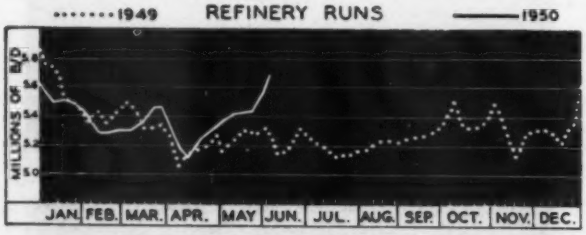


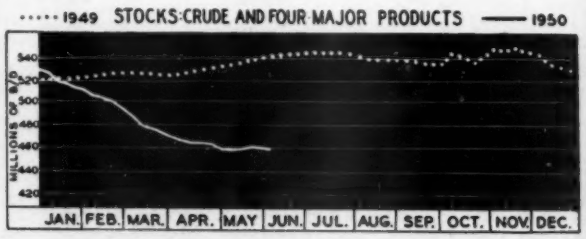
A.P.I. REFINERY REPORT, JUNE 3

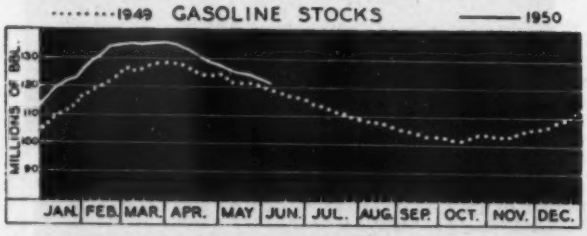
(Thousands of barrels)

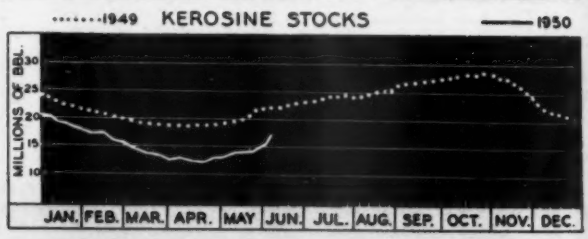
District—	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline†	Kerosine	Distillate	Residual	Bureau of Mines, June 1949: Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	941	375.1	34.6	198.7	177.2	27,102	5,574	10,321	9,626	694	285.9	24.3	114.0	143.9
Appalachian:														
District 1	95	42.6	4.9	10.1	10.4	2,616	370	465	355	90	42.8	3.1	8.5	6.3
District 2	68	35.7	4.9	6.0	14.3	913	91	118	140	58	29.9	1.8	4.7	10.7
Ind., Ill., Ky.	1,058	568.3	64.0	139.4	153.0	24,042	3,149	6,139	2,703	865	487.6	40.8	103.3	121.3
Okla., Kans., Mo.	500	265.0	17.0	99.4	58.0	13,190	954	3,627	1,028	423	236.1	18.8	81.3	57.2
Inland Texas	211	140.4	11.8	30.7	41.4	3,405	341	859	747	217	161.5	11.6	19.2	45.6
Texas Gulf Coast	1,172	559.2	85.6	249.6	215.0	18,233	2,807	6,215	3,671	1,236	647.8	68.5	170.1	224.9
La. Gulf Coast	491	242.1	63.4	102.4	60.3	5,653	2,415	2,683	1,850	401	215.5	29.9	94.0	41.8
N. La. and Ark.	74	27.4	8.7	14.4	12.7	2,793	322	469	199	76	32.8	6.2	11.9	15.9
Rocky Mountain:														
New Mexico	13	7.1	0.4	1.9	2.7	119	25	51	33	11	5.8	0.3	1.8	2.7
Other Rocky Mtn.	193	87.3	3.3	38.2	36.6	4,943	318	1,498	552	170	77.1	4.7	30.2	31.3
California	872	371.9	18.7	115.9	291.3	18,078	1,003	10,004	18,087	921	373.8	13.8	132.2	339.9
June 3, 1950	5,688	2,722.1	317.3	1,026.7	1,073.9	121,087	17,369	42,449	38,991	5,162	2,596.6	223.8	771.2	1,040.6
May 27, 1950	5,591	2,672.0	332.4	1,028.7	1,060.1	122,757	16,075	40,607	39,308	.....	.....	.....	.....	.....
June 4, 1949	5,341	2,606.3	246.0	851.3	1,118.1	119,106	21,858	58,597	64,063	.....	.....	.....	.....	.....

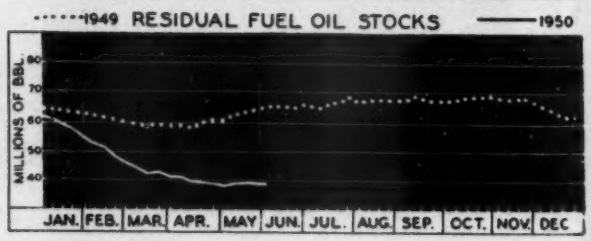
*At refineries including natural blended. †Finished and unfinished.

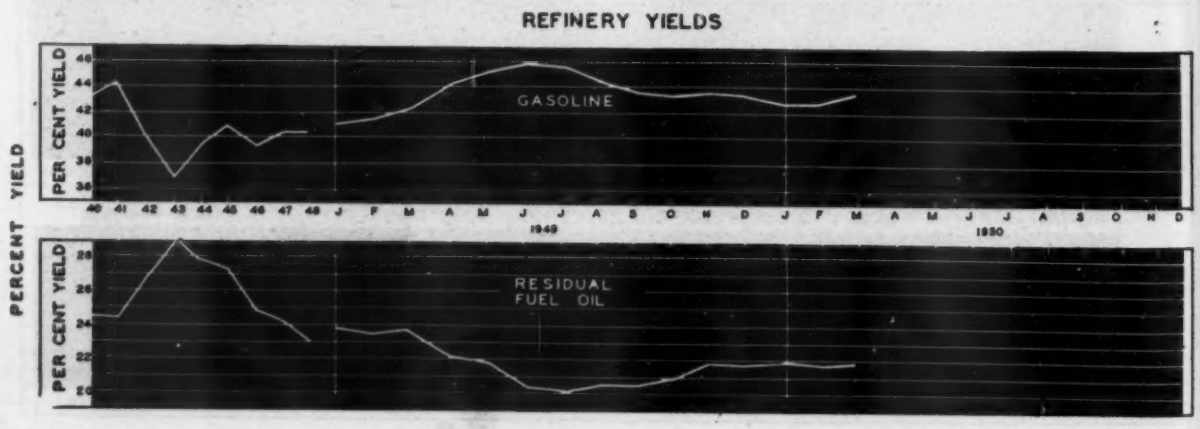












CRUDE PRICES

GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.53	....	....	....
19-19.9	1.63	....	....	....
20-20.9	1.73	$2.25	....	$2.12
21-21.9	1.82	2.27	....	2.14
22-22.9	1.92	2.29	....	2.16
23-23.9	2.02	2.31	....	2.18
24-24.9	2.12	2.33	$2.56	2.20
25-25.9	2.22	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.65
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

GASOLINE prices in the Group 3 area seem to have leveled off for the present with the low at 10.125 cents a gallon and the market at or near a balance at that figure. However, any big jump in demand during June could create a deficiency that would push the price up still further. Most marketers feel that gasoline demand in July will be great enough to pull stocks down to the point where further price increases will be required to boost production. It is this belief that has produced a very strong gasoline market. Suppliers with a little surplus gasoline on hand are not rushing to put it on the market since they feel that July and August requirements will be record-setting levels.

About the only products in the Group 3 market that can't be classified as firm are No. 1 fuel and kerosine. This trend for the light fuels is rather general for areas east of California. The generally posted price for barge deliveries of kerosine in New York Harbor is 9.1 cents a gallon, but there are reports of .2-cent discount off postings. In the past 4 weeks, about 46 per cent of kerosine production has gone to storage compared with 17 per cent for distillate fuels. For the same period, kerosine production was up 29.3 per cent from last year while distillate gained only 19.8 per cent.

A greater relative gain in stocks of kerosine is to be expected since home owners, using kerosine and No. 1 fuel for heating, have very little storage space and buy little or no fuel during the summer. Since consumer sales are limited to other uses, there is less incentive for resellers to add to stocks during the summer. At the current rate of increase, kerosine stocks would reach last year's peak before the end of August.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of June 12, 1950. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅛-10⅜	12	10⅜-10¾
Premium gasoline, 86-88 octane	10¾-11½	13	11¼-11½
42-44 w.w. kerosine	8⅜-8⅝	8.9-9.1	8-8½
No. 2 straw fuel oil	7⅝-7¾	7.6-8.0	7-7¼
No. 6 residual	$1.65-1.75	$2.05	$1.65-1.80

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5⅛	4⅝	4⅞
Grade 18-55	6.15	5.65	5.9

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	10.5-11.5
750 vis., No. 3-4 neutral	12.75-13.75
2,000 No. 5-6 neutral	14.5-15.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	18-18.5
200 vis., No. 3 neutral, 0-10 pp.	12.5

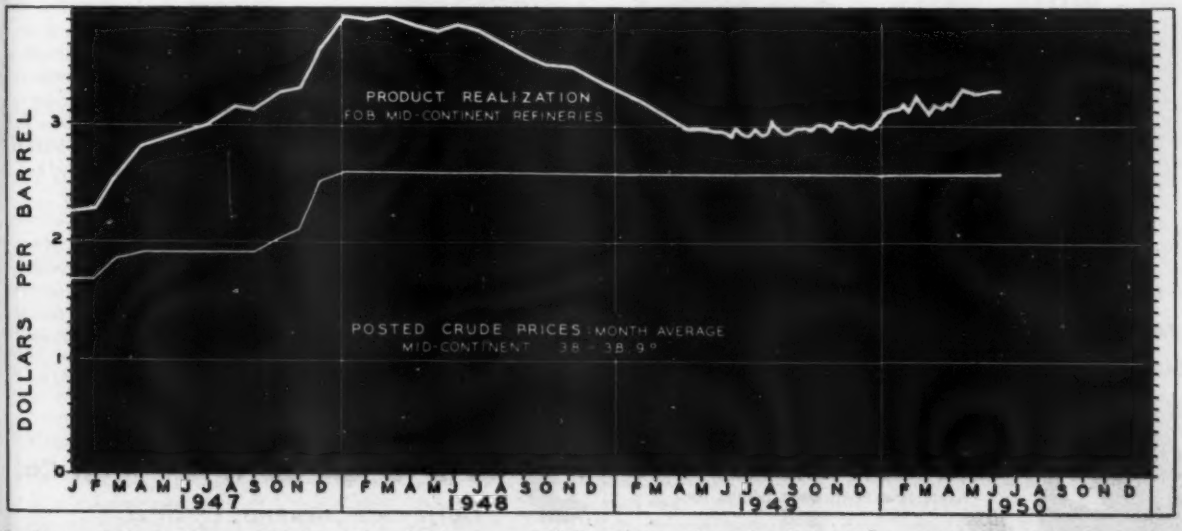
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	20.5
180 vis., 0 p.t. neutral	21.5

WAX

Mid-Continent

132-134 A.M.P.	4.50



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.31 for week ended June 3, $3.32 for previous week, and $2.97 for June 1949.

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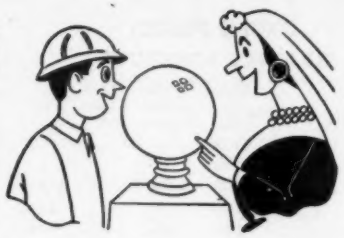
HUNTING FOR OIL?



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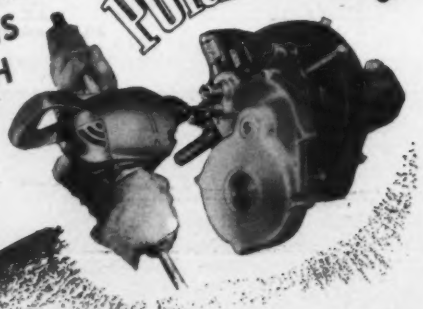

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EQUIPMENT MEN . . . in the News

Clark Makes McCarthy Turbo Sales Engineer at Houston

J. E. McCARTHY

R. M. GREENE

Clark Bros. Co., Inc., Olean, N. Y., has announced the transfer of J. E. McCarthy to the staff of its Houston office. McCarthy will act in the capacity of sales engineer in the Turbo-Machinery division. The change was necessitated by the increased number of applications of centrifugal compressors in the natural-gas and petroleum industry.

After graduating from Cornell University with a degree in mechanical engineering, McCarthy entered the U. S. Navy and was discharged in 1946. Since 1946, he has been an application engineer in the Turbo-Machinery division of technical sales and recently has been acting manager of the turbo machinery technical service department.

Clark also has announced the appointment of R. M. Greene as manager of the Turbo-Machinery technical service department, succeeding J. E. McCarthy. Greene is a graduate of the school of mechanical engineering of Cooper Union. He was previously employed in the service department of Foster-Wheeler Corp.

Iverson Supply Announces Changes in Sales Staff

Ed Robertson, vice president in charge of sales, Iverson Supply Co., Tulsa, has announced several additions and changes in the company's sales staff. Glenn Wilson has been added to the Tulsa city sales staff. Prior to becoming associated with Iverson, he spent several years in the employ of Bovaird Supply Co. Jay Morgan has been added to the Houston city sales staff. Previous to his connection with Iverson, he was associated with Jareki Manufacturing Co.

R. S. Searls, Jr., has been promoted from store manager of the Odessa store to field salesman in the Odessa area. David Crichton, Jr., succeeds Searls as store manager. M. J. Hunter has been transferred from the Okmulgee, Okla., store to the new Snyder, Tex., store in the capacity of assistant division manager in charge of the Snyder area.

Henry F. Oliver of Midland is West Texas division manager. J. W. Wright has been transferred from Kermit, Tex., to Snyder as store manager. W. D. "Bill" Barnett, formerly with Bovaird, recently joined the Iverson organization, and will serve as field salesman at Snyder.

Campbell Named as Clapp Instrument Sales Manager

Arthur S. Brown, president of Clapp Instrument Co., Webster, Mass., makers of the Acragage, has announced the appointment of A. E. Campbell as sales manager.

Campbell has long been associated with the instrument industry as a sales executive, and is widely known for his substantial contribution in that field.

Largest One-Piece Head Used at Paulsboro Plant

This flanged, dished, and flued head spun by Lukens Steel Co., Coatesville, Pa., for installation on the flash tower of the 60,000-bbl. a day Socony-Vacuum plant at Paulsboro, N. J., weighs about 20,000 lb., is 20 ft. and 4¼ in. in diameter, and has an overall depth of 59 3/16 in. It was spun of stainless-clad steel, type 405, because of that material's resistance to corrosion from sulfur compounds at high temperatures.

Kobe Sets Up New Rocky Mountain Headquarters

Kobe, Inc., has announced the establishing of its Rocky Mountain headquarters at Casper, Wyo., with Maury Anderson, district representative, in charge.

The change has been made to enable Kobe better to serve its hydraulic-pumping-equipment users in the Rocky Mountain area. Prior to setting up headquarters at Casper, Kobe maintained offices at Rangely, Colo.

O'Connor to Tour European And Near East Oil Fields

D. T. O'CONNOR

D. T. O'Connor, New York City, recently left for Europe and the Near East where he will visit all of the oil-producing areas on behalf of Shaffer Tool Works; M. J. Crose Manufacturing Co., Inc.; Drilling & Service, Inc.; Mayhew Machine & Supply Co.; and Frank Wheatley Pump & Valve Manufacturer.

During O'Connor's absence, his office will be under the supervision of Ross R. Chenault, who recently joined his organization.

Bethlehem Supply Announces Sales Organization Changes

According to a recent announcement by S. M. Bash, vice president, Bethlehem Supply Co., T. W. Thurmond, Jr., formerly local representative for Bethlehem, has assumed the duties of oil-field engineering representative for Bethlehem Steel Export Corp., with headquarters in New York City.

Additional changes announced by the company are as follows: K. G. Wagner has been employed and appointed store manager and field representative at the Corpus Christi store. J. D. Reynolds, former floor man in the Kilgore, Tex., store, has been promoted to field representative and will assist in field sales in the Kilgore area. Clyde Ricks, formerly floor man in the store at New Iberia, La., has been promoted to assistant store manager.

R. C. Repp, formerly store manager and field representative at Beaumont, Tex., has been transferred to the Houston store as field representative

and will confine his endeavors to sales work in the Houston area.

B. E. Young, formerly field representative out of the Houston store, has been transferred to Beaumont as store manager and field representative, and R. E. Garlington has been transferred from the Tulsa office to Midland, Tex., in the capacity of engineering representative and will assist in machinery sales in the West Texas-New Mexico district.

Meek to Represent Young In Mid-Continent Area

J. R. Meek of Tulsa, a veteran of 16 years in the heat-transfer industry, is the new Mid-Continent area oil-field representative for Young Radiator Co. of Racine, Wis., and Mattoon, Ill.

Meek for the past 10 years has concentrated his entire time in pioneering and promotion of sales of air-cooling equipment to the petroleum industry. Now the exclusive distributor of Young Radiator products in the Mid-Continent area, Meek has established offices in the Bob Ward Building in Tulsa.

Morrill Elected to Midwest Piping Board of Directors

Guy L. Morrill, Los Angeles, was elected to the board of directors of Midwest Piping & Supply Co., Inc., at the company's annual stockholders meeting.

The manager of the company's Pacific division succeeds W. G. Hooper of St. Louis, deceased, as director. All other directors and officers of the company were reelected.

Buda Engine & Equipment Plant at Dallas Completed

Buda Engine & Equipment Co., subsidiary of Buda Co., has completed and occupied this new plant located in the Trinity industrial district of Dallas. The building provides 17,080 sq. ft. of covered floor space, and an additional 3,000 sq. ft. of concrete storage area with truck-loading facilities in front and rail-loading facilities in the rear, according to H. F. Moroney, treasurer and manager.

Mid-Continent Supply Opens Two New Stores

Mid-Continent Supply Co.'s network of branch stores has been extended by two with the opening of new stores at Elk City, Okla., and Oklahoma City.

Ken W. Davis, president and general manager of Mid-Continent, has appointed W. B. Hickman, Jr., to serve as manager of the Elk City store, and C. R. Tatum to serve as manager of the Oklahoma City store. J. P. Alexander, Jr., is district manager, while S. R. Clinkscales is manager of the division.

Clover and Wall Get New Westcott & Greis Positions

J. H. Satterwhite, sales manager and treasurer of Westcott & Greis, Inc., Tulsa, has announced the appointment of Cade C. Clover as manager of the northern division of the company with headquarters in Tulsa. This division consists of Oklahoma, Kansas, and Texas Panhandle, northern New Mexico, and western Arkansas.

Harold W. Wahl has been appointed manager of the company's southern division with headquarters in Dallas. This division consists of Texas with the exception of the Panhandle, southern New Mexico, Louisiana, and Arkansas except the western area.

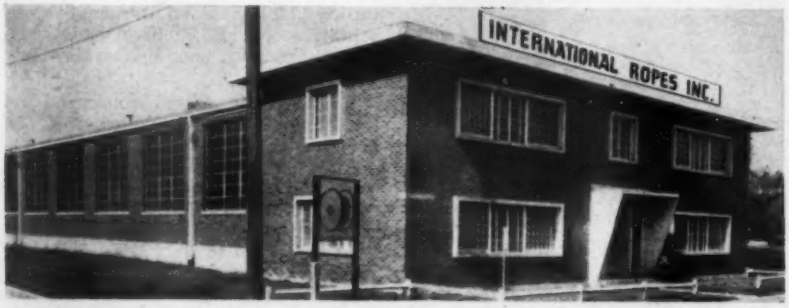
Mercier Joins Perforating Guns as Division Manager

V. J. MERCIER

Paul Charrin, president of Perforating Guns Atlas Corp., Houston, has announced the appointment of V. J. Mike Mercier of Wichita as division manager for its Kansas operations. Mercier formerly served as sales manager of Mountain Iron & Supply Co.

Perforating Guns will establish Kansas headquarters in Wichita, while field service units will be located in strategic oil centers beginning with Great Bend, Kans. Prior to his position with Mountain Iron & Supply Co., Mercier was Kansas division engineer for Lane-Wells Co., having preceded that with 8 years of seismograph exploration work.

International Ropes Opens New Houston Plant



International Ropes, Inc., manufacturer of wire rope, has just opened this new plant and offices at Houston. Jobbers and distributors are being established in all principal points throughout the oil country, it was announced by E. E. Lambert, president of the firm. Stock carried at the Houston plant includes rotary-drilling lines, core barrel and sand lines, tubing and rod lines, winch lines, and a full line of industrial and marine ropes. Plant manager of the new company is James A. Halbert.

Trackson Makes G. M. Graetz Works Manager

Trackson Co., Milwaukee, has announced the appointment of George M. Graetz as works manager, effective immediately. He will be responsible for the manufacturing activities at both Milwaukee plants.

Graetz was recently works manager for Line Material Co. of South Milwaukee and previously had been works industrial engineer at the Duluth plant of American Steel & Wire Co.

Shira Transferred to P-B Mid-Continent Sales

R. W. SHIRA

J. P. Magoffin, general sales manager, Patterson-Ballagh, division of Byron Jackson Co., recently announced transfer of R. W. (Bob) Shira. Headquartered at Odessa, Tex., Shira will assist A. O. Wells, district manager.

Shira joined P-B in 1946. He had been in the service division at Patterson-Ballagh, later becoming advertising manager in which capacity he served for over a year. He then joined the California sales division in Los Angeles basin where he remained until his transfer to P-B Mid-Continent sales division.

National Foam Moves Philadelphia Office

The Philadelphia offices of National Foam Systems, Inc., have been moved to the firm's plant at West Chester, Pa., in a move to provide better customer service.

Fisher L. Boyd, president of National Foam, in announcing the move, said: "The move will consolidate company activities at one address, and will insure more prompt and efficient service in handling of orders and engineering cooperation with customers."

The office building at the West Chester plant has been altered to provide for general offices, and the laboratory and engineering departments have been expanded.

Death Ends Career of Graver Construction Head

Edward B. Heyden, 52, head of Graver Construction Co. and vice president of Graver Tank & Manufacturing Co., Inc., died at his home in Cranford, N. J., April 18, 1950.

Heyden had been associated with Graver since 1946 and had personally supervised Graver construction projects. For 14 years previously he was general superintendent for Lummus Co. He had also been associated with American Bridge Co., Tide Water Associated Oil Co., and E. B. Badger & Sons.

New U. S. Steel Tube Mill Is Placed in Production

A new tube mill with an annual capacity of 100,000 tons of electric welded steel pipe, in sizes ranging from 26 to 36 in., started production last month in McKeesport, Pa., at the National Works of U. S. Steel's National Tube Co.

Stock for the mill consists of plates from ¼ to ½ in. in thickness. These plates, whose steel composition runs 0.20 to 0.30 carbon and 0.85 to 1.25 manganese, weigh close to 2 tons each. Standard length is 40½ ft. while the widths will vary, according to specifications, from 78½ to 110 in.

The conversion of plates to tubes is accomplished in 16 big new machines which are the major units of the mill. Ample use of roller conveyors for moving the heavy material from unit to unit makes possible an assembly-line precision of operation.

J. A. Friend Named Senior Nordberg Vice President

J. A. FRIEND

James A. Friend has been appointed senior vice president of Nordberg Manufacturing Co., Milwaukee, according to an announcement by Robert E. Friend, president.

James Friend, former vice president and general purchasing agent, will take over the duties of F. Howard Kilberry, who resigned to become a management consultant in charge of Superior Engine Division of National Supply Co. at Springfield, Ohio.

Floyd T. Finley has been appointed general purchasing agent of the Milwaukee division of Nordberg to succeed James Friend. It was also announced that D. A. Cheyette, vice president of the crusher division, has been elected to Nordberg's board of directors. Arthur W. Mueller was appointed assistant controller of the company.

Ledyard Forms New Exploration Firm

Paul H. Ledyard has resigned as vice president of Southern Geophysical Co. to form his own firm, Standard Geophyhical Co. He will be succeeded as vice president at Southern by R. G. Dana, formerly secretary-treasurer and supervisor of the firm.

Dana began his industrial career with Stanolind Oil & Gas Co. in 1934. He was serving Stanolind as party chief when he joined Southern Geophysical in 1945.

Standard Geophysical will specialize in seismic record review and supervision. Ledyard started his geophysical career with Stanolind with which he spent 10 years. He was serving Stanolind as assistant division supervisor when he joined Southern as vice president.

Motorola Starts Erection Of Mid-Valley Radio System

Motorola, Inc., Chicago, has started installation of an $800,000 microwave relay system for Mid-Valley Pipe Line Co., which, when completed and placed in operation in September, will be the most extensive of its kind in the world.

The multi-channel system will furnish telephone, teletype, and extension of mobile radio communications from Longview, Tex., to Lima, Ohio.

Preliminary surveying for the cross-country project has been completed. The installation of microwave and VHF stations is scheduled to start soon at Abbeville, Miss.

Gribbin & Baylor Move

The Houston office of Gribbin & Baylor, representatives for Dynamatic Brake Co., have been moved to 2930 Pease Ave., Houston.

(Continued on page 183)

New York Nomads Hold Annual Invitation Dinner

Officers and guest speakers attending the invitation dinner sponsored each year by the New York Chapter of Nomads are: Standing, Russell D. Heath, regent; K. D. Demarest, sergeant-at-arms; John D. Evans, assistant treasurer; A. V. Simonson, past president; James A. Clark, honorary member; James W. Reed, past president; and John H. Baird, past president. Seated are: E. T. Landgraff, secretary; Henry J. McAdams, president; Ford C. Frick, president of the National Baseball League; Branch Rickey, president of the Brooklyn National League Baseball Club; Maurice F. Delano, treasurer; F. J. Jobst, assistant secretary; E. R. Smoley, assistant sergeant-at-arms; and Val R. Wittich, Jr., regent. President McAdams introduced Rickey, who in turn introduced Frick, the principal speaker of the evening.

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Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY...

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10% Discount three or more issues.

UNDISPLAYED CLASSIFIED 12c a word one issue. 10% Discount three or more issues. $3.00 minimum charge. Blind Box in our care counts nine words. Payable in Advance.

EQUIPMENT FOR SALE

1 COMPLETE String of Rotary Drilling Tools: Ideal Drawworks, Wheland Clutch, 7¼ x 14 New Type Wheland Pump, Waukesha Motors, 3600' 4½" Drill Pipe, 122' Lee C. Moore Champion Rotary Derrick, Tool House and all necessary equipment goes with this rig. Anyone interested either write H. M. Williams Drilling Company, 701 Bitting Building, Wichita, Kansas, or telephone 48542.

1—Shot Hole Drill Truck, Chassis WHAX 1947 Dodge, Mayhew Drilling Unit—Model 600 Complete w/ Gardner-Denver 4½x5 mud pump. Mast 19 feet—Kelly 12½ feet. 100 feet 2⅜" Used Drill Rod. 3—Dodge Water Trucks: 2 Ton Chassis WHAX—2 Ton, 400 Gallon Tank, Tulsa 18—Winch. 1—Model DDH—Oliver Cletrac Tractor w/ Hercules 6 cylinder Diesel Engine, Electric Starter and battery ignition complete with southwest cable controlled trailbuilder and Buckeye Double Drum Power Control Unit. If interested, write or call The Atlantic Refining Company, c/o Mr. V. H. Gray, P. O. Box 2819, Dallas, Texas, Telephone P7-6484, Station 8-273, Dallas.

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQUIPT. CO
3415 Westminster, Dallas 5, Texas

Used Wood Tanks For Water-Flooding

5—vertical cypress tanks closed, 10' dia. on bottom, 9' dia. on top, 8' high, 2¼" staves, have manholes.
18—vertical cypress tanks, open top, 8' dia. on bottom, 7' 6" dia. on top, 6' high, 2¼" staves
6—vertical oak tanks, closed, 7' 4" dia. on bottom, 6' dia. on top, 8' high, 2½" staves, have manholes
10—vertical cypress tanks, closed, 9' 6" dia. on bottom, 8' 6" dia. on top, 7' 6" high, 2¼" staves, have manholes
7—vertical cypress tanks, closed, 11' dia. on bottom, 10' dia. on top, 8' 6" high, 2¼" staves, have manholes
28—vertical cypress tanks, closed, 10' dia on bottom, 9' dia. on top, 17' 4" high, 2¼" staves, have manholes
2—vertical redwood tanks, open top, 17' dia. by 17' high, 3" staves
All tanks complete with round hoops and lugs.

These tanks were used for beer storage and are in

FIRST CLASS CONDITION

Other sizes also available. Please write for complete specifications and prices.

• • • • • •

New and Guaranteed Used STEEL TANKS

Bolted Type up to 10,000 barrel. Welded and Riveted up to 74,000 barrel.

Your inquiry will be appreciated.

A. GREENSPON PIPE CO., INC.
3615 Olive St., St. Louis 8, Mo.

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

COOPER Single Drum Winch Tractor. Model W-201-26, with 45-foot mast, A-1 condition. $2250.00. Rogers Pipe & Supply Co., Tulsa, Phone 3-2072.

FOR SALE: Wilson Mogul drilling rig with portable derrick complete. Suitable for 4500' depth. Now running in Bebee Field, Pontotoc County, Oklahoma. Contracts available. Lake Oil Company, Ada, Oklahoma.

SPUDDERS: Good used equipment. Fort Worth Models Super H. and C. Wichita 55. Wilson rotaries. Franks and Longyear machines. New and used tools and supplies. Fishing tools rented. Everything for well drilling. Pressey & Son, Pueblo, Colorado.

FOR SALE: National "75" with 2 Engine Rig Drive, Wilson "Giant" with Dual Engine Drive, RX1SV 12-Cyl. LeRoi, Two RX1V 8-Cyl. LeRois, C-12 (7¼x12) Emsco Power Pump, D-13000 Caterpillar, PA-100 International, WOKU Waukesha, Radiator for WAKU Waukesha. Jones, Shelburne & Guffey, Inc., 501 N.E. 26th, Oklahoma City, Oklahoma. Phone: 5-5448.

FOR SALE: One 7¼ x 14 Whelan model 11000 Slush pump. New fluid end, gear box A-1. Melton Supply Company, Box 1360, Seminole, Oklahoma.

BARGAIN FOR QUICK SALE

Large Steam Rig Complete Ready to go. 14x14 Engine, 18" & 20" Pumps, 10,000' 4½ Drill Pipe, 136' Drk All 300 Ton Equipment. Everything Good Condition. **McDaniel & Beecherl Drlg. Co.,** 521 Republic Bank Bldg., Dallas, Texas, or Phone 3651, Odessa, Texas.

EQUIPMENT FOR SALE

CULVER Vertical Furnaces for exfoliating Perlite $10,000 compared to $100,000 for old style, also purest of Perlite for sale. Particulars Box 2153-OJ, Denver, Colo.

CORE Drill Equipment for Sale: Two "Franks" truck mounted core drills, 2,000' capacity; one shop built truck mounted core drill, 1,600' capacity. All mounted on KR-11 International trucks. Four KB-7 International oil field trucks with jin poles and model 34 Tulsa winches. Four pole trailers with bolsters, three of them equipped with dollies for holding pipe loads. Approximately 2,500' used 2⅜" x 20' drill pipe with 3⅜" tool joints. Contact Mr. K. J. Reid or Mr. W. H. Hawkes, P.O. Box 1654, Oklahoma City. Telephone 2-6381.

BOILERS FOR SALE: 18 Code Oil Field Boilers, 50 to 87 H.P., 100 to 200 Lbs. W.P., Operated under Hartford into 1948, not fired since. Located on Leases vicinity Pampa, Texas. Offered subject to prior sale $500.00 to $700.80 Each, as is where is. Contact W. L. Godfrey or Max Harbison, Kewanee Oil Company, Pampa, Texas.

FOR SALE: Portable deep well servicing rig. Cardwell model H, code HSMZS, serial No. HS-951, single drum hoist with 8" x 7" telescoping mast. Powered with 6MZ Waukesha with gas-gasoline carb., regulators and volume tank. Unit is mounted on 1946 model 25 VBS 5 ton Reo truck. This equipment in good shape and has had very little use. $8750.00. Marena Oil Co. Box 720, Cut Bank, Montana.

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps — two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

12,000 ft. 6⅝ O.D. Seamless #17.65 at .75c ft.
46,000 ft. 6⅝ O.D. T.C. Lapweld #19.45 at .80c ft.
150,000 ft. 6⅝ O.D. New Range 3 Elec. Weld #17.02
50,000 ft. 12¾ O.D. New Seamless #41.51 Nat Tube Make Range 3
All subject to prior sale, immediate delivery.
Dismantling 50-55,000 Bbl. Tanks. Sheets 5' x 15' & 6' x 20'
From 3/16" to ½" Plates included. Sell any part.
W. C. BERRY, TULSA, OKLA., PHONE 3-6141

FOR SALE — PRICED RIGHT — IMMEDIATE DELIVERY

GATHERING and FLOW LINE PIPE

15,000'—1 ⅞" OD x .120/.160 Wall 1.6# New Seamless P. E. 16' to 28' lengths
20,000'—1" Standard Black New Seamless 1.68# P.E. 16' to 24' lengths.
30,000'—2" OD x .220/.250 Wall 4.5# New Seamless P.E. 16' to 28' lengths.
20,000'—3" OD x .172 Wall 5.2# New Seamless P.E. 18' to 24' lengths.
30,000'—3" OD x .300/.350 Wall 9.7# New Seamless P.E. 16' to 28' lengths.

LARGE O.D. LINE PIPE

5,000'—12¾" OD x .250 Wall 33.38# New E.W. 40' lengths.
16,000'—14" OD x .375 Wall 54.57# New Seamless A-106 Grade A 40' lengths.
1,800'—20" OD x .312 Wall 65.71# New E.W. 40' lengths.
1,800'—20" OD x .344 Wall 72.16# New E.W. 40' lengths.
3,000'—24" OD x .312 Wall 79# New E.W. 40' lengths.

OTHER SIZES LINE PIPE AND TUBING AVAILABLE.
FOR PRICES CONTACT

A. J. STRUBEL
Sidney 1791 . . . 4946 Murdock, St. Louis, Mo.

EQUIPMENT FOR SALE

FOR SALE: Wilson Giant draw works, powered by two JL-1335 Buda engines with Wilson chain compound. Unit completely overhauled. Can sell separate or with a complete rig. For information, call or write Melton Supply Company, Box 1360, Seminole, Oklahoma.

FOR SALE: FAILING Model 36—800 ft. capacity, A-1 condition; 500 ft. drill pipe, 4 x 5 Gardner-Denver pump, 1949 International water truck. Complete with tools, subs, bailers, etc. Priced right. Sam Clark, Jr., 217-4th Ave. E., Roundup, Montana. Phone 197R.

FOR SALE: One, type-100 National Drilling Rig has drilled only two wells. With 800,000 pounds capacity jack-knife derrick. Box D-448, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Model L-107 Allis-Chalmers Fred E. Cooper winch unit for deep well servicing. Excellent condition. Priced to sell. Degen Pipe & Supply Co., Box 107, Red Fork Station, Tulsa, Oklahoma.

APPROXIMATELY 4300′ of 3½″ FH Drill Pipe, two 4½″ x 30′ Drill collars, Wilson elevators, Mission slips, one American overshot, slips for same, all sizes, few other 3½″ items, located at Upton, Wyoming. Priced at a real bargain. Kiowa Drilling Company, Inc., 717 Union National Bank Building, Wichita 2, Kansas. 3-8013.

FOR SALE: One 150 HP Type DFXE Hercules Diesel Engine; 1800 RPM; 150 Hours total time; bargain. We buy and sell Pumps, Engines, Boilers, Compressors, Generators. Kinslow Power & Equipment, Inc., 817 South Boulder, Tulsa, Oklahoma.

FOR SALE

4 Buda P-1879 Gas Engines with radiators. Running when traded recently. $1,250.00 each.

WILSON MANUFACTURING CO., INC.
Wichita Falls, Texas

EQUIPMENT

100 OCTANE REFINERY

Cotton Valley, La.

5—Upshot heaters — U.O.P. type Vogt—Kellog—G-R exchangers & condensers. Fractionating columns. Drums and pressure vessels.

I-R—B-J—National Transit—Union — Hills-McCanna—Worthington centrifugal, reciprocating, steam, turbine and motor driven pumps.

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COMPLETE LISTINGS

DULIEN STEEL PRODUCTS, INC
of Washington
P. O. BOX 667
COTTON VALLEY, LA.
PHONE: COTTON VALLEY 26

EQUIPMENT FOR SALE

FOR SALE: Used casing in good condition. Approximately: 800′ of 15½″, 1200′ of 13″ 50# Seamless, 2000′ of 10¾″ 40# Seamless, 2600′ of 8⅝″, 32# Seamless. H. C. Bennett, Box 31, Augusta, Kansas.

ENGINES: 3—150 HP ME 66 Murphy Diesels. Excellent condition. Will sell 60% off new price. Must convert rig to gas. Interested in National C-250 or 18″ Pump. Fitzpatrick Drilling Company, Casper, Wyoming.

FOR SALE: Repossessed 1942 Sullivan Rotary Drill Model "N" Trailer mounted, 50 h.p. Buda power, hydraulic throughout except cable drum, Gaso 4/10 mud pump 33 h.p. motor, 1900 ft. 2⅛ P.K. Rod, many bits, heads, tools, good condition. Can be purchased for outstanding indebtedness $3500.00. Ben Sherman, Phone 243, Deming, N. M.

VALVES—70 new 1″ Crane Globe, flanged, 150 lbs. Cat #3656XR—$15.00 each. H. Loeb & Son, 4643 Lancaster Ave., Phila. 31, Pa.

FOR SALE: New 1¼″ Improved plow steel wire lines 6 x 19 R L Hemp Core. One Spool 3500′ at 28c per ft. Four Spools 1800′ at 24c per ft. Thirty Spools 600′ at 20c per ft. FOB Okla. City, Okla. General Tool & Supply Co. P.O. Box 4387—1319 S.E. 29th. St., Okla. City, Okla.

PORTABLE ROTARY RIG DRAW WORKS (Wilson) for Shallow Oilwell (about 2000′) Drilling, with telescoping derrick mast, 4 legs, Roller Bearing Crown Block, all unitized with ROTARY TABLE on long skids, and tires — HIGHLY PORTABLE. Also: 7¼x10 mud pump with Heavy Duty Climax Engine. Will sell above items for $12,000 including BREWSTER oilbath Rotary Table. C. M. BARRINGTON, Phone 4915, Box 831, Coleman, Texas.

64′ MAST, constructed of 8″ Pipe with box type welded reinforcing, ROLLER BEARING CROWN BLOCK. Capacity 150,000# or more. Will sell for $900.00. C. N. ADKISSON, McCamey, Texas.

FOR SALE: One combination houseboat and boathouse. Built on steel barge 85 ft. long x 28 ft. wide x 9 ft. deep. One end constructed with wings similar to a floating drydock with cradle to accommodate a 42 ft. cruiser. An installed pump will pump the barge down, allowing the cruiser to be floated into place. The barge is then pumped up and the cruiser stored dry. Entire barge is covered with roof and sides and boat end is closed with overhead door. Opposite end houses very fine quarters, lounge, galley and washroom and an awning covered sun deck. Ideal for the sportsman or oil operation in inland waters. To our knowledge the only vessel of its kind in existence. Can be inspected by appointment at Rockport, Texas. Write Gulfport Shipbuilding & Drydock Corporation, Port Arthur, Texas, or call 2-6486.

FOR SALE: In our Geological Department here, 3 large mahogany Wall Map Cases. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

FOR SALE: One Gumbo Buster 26″ Oil Bath rotary table in good running condition. Attractive price. Melton Supply Company, Box 1360, Semniole, Oklahoma.

FOR SALE in Siler Trucking Company's Yard, Craig, Colorado, 828′ of new 6⅝″ OD 24# 8 RT, J55 ST&C SS Casing. $2.00 per foot. Cities Service Oil Co., Patridge, Bartlesville, Okla.

WAR SURPLUS MACHINERY
Gaso, Byron Jackson, Aurora, Wayne, Lombard & Hale Fire Pumps with Engines, 1½ to 25 KW Generator Sets or Light Plants, Engines, Suction Hose, Fire Hose, Victaulic Couplings & Etc. Write for listing. H. A. McCarthy, 310 Thompson Bldg., Phone 5-3296, Tulsa, Oklahoma.

FOR SALE
(SUBJECT TO PRIOR SALE)
3 Bolted tanks, 2 in original crates and one assembled, (100 Bbl.). 69′-14″ 57# Drive Pipe; 170′-10¾″ 41# Drive Pipe; 407′-10¾″ 32.75# Casing 8Rd. Thd. Smls.; 3045′-8″ 24# Casing 8Rd. Thd. Smls.; 6286′-7″ 23# Casing 8Rd. Thd. Smls.; 8101′-3″ 9.20# Tubing Smls.; 1453′-2⅛″ Tubing EUE Smls.; 14,228′-3″ 6.40# Regular 10Rd. Thd.; 375′-¾″ Pumping rods; 9-5″ Orbit Gate Valves; 9-3″ Orbit Gate Valves; 3-2″ Orbit Gate Valves; 3-2⅞″ x 6′ Parmco Combination Packer; 1-2⅞″ x 6″ Larkin Screw Trip Packer; 1-3″ x 6″ Parmco Packer; 1-2⅞″ x 6″ Gas Anchor Packer. M. B. Belden Office at 425 2nd St. N. W., Canton 2, Ohio, Phone 4-6147.

EQUIPMENT FOR SALE

USED ROTARY AND CABLE TOOL DRILLING TOOLS, WIRE LINES. E. A. KELLY, BOX 861, OKLAHOMA CITY. PHONE 5-5407.

EQUIPMENT WANTED

INTERESTED in small portable double-mast rig, capable of drilling to approximately 2000 feet, with or without drill pipe. Equipment must be in good condition and reasonably priced. Preferably located in Southwest Texas. Contact:

MAKIN DRILLING COMPANY
Box 131, Hobbs, New Mexico, Phone 131

WANTED

CATERPILLAR SCRAPERS

Models 70 and 80

JOHN FABICK TRACTOR CO.
3100 Gravois Ave.
Phone: Laclede 8900 L.D. 5
St. Louis 18, Mo.

HELP WANTED

WANTED—Geophysicist with geological background by independent oil company to review, interpret seismic data. Must have knowledge of instruments and techniques. Permanently located in Houston. State age, training, experience and expected salary. Address Box D-549, The Oil and Gas Journal, Tulsa, Oklahoma.

SALES ENGINEERS
OPERATIONS SUPERVISORS
PERFORATOR OPERATORS

Only Experienced Men Need Apply.

WRITE ONLY

WELEX JET SERVICES, INC.
3909 Hemphill Street, Fort Worth 9, Tex.

MUD ENGINEERS

Only experienced men in sales and servicing need apply. Good pay, with merit bonus. All replies kept confidential.

P. O. BOX 5156
Tulsa, Oklahoma

WANTED

FOR CHEMICAL PLANT

Located in South

ESTIMATORS

Must be experienced engineers, under 40, familiar with Refinery and Chemical Plant design and capable of estimating process equipment installations from flow diagrams and specifications. Give full information, experience record and salary expected.

DRAFTSMEN-DESIGNERS

Preferably with ME, CE, or EE degree, under 40, with at least three years drafting experience in Chemical or Oil Industry. Give full information, experience record and salary expected.

BOX D-530
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

HELP WANTED

GEOLOGIST wanted by old independent oil company with substantial production and financial backing. Must have varied experience in West Texas and/or other MidContinent areas, and be capable of heading department. State age, scholastic training, former affiliations, years and record of experience, present assignment, date of availability and expected salary. All applications will be held confidential. Address: Box D-518, The Oil and Gas Journal, Tulsa, Oklahoma.

FOREIGN and Domestic Oil Employment Directory (including late supplement of oil companies and drilling contractors in Western Canada). Over 500 listings in drilling, production, refinery, natural gasoline, pipelines, geological, exploration, supplies, manufacturers, services and refinery and pipeline contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla. (Our 30th year).

SALES REPRESENTATIVES
Soundly established, progressive firm has openings for three district sales representatives. Experience in pipe, valves or fittings an asset. Excellent opportunity. Write Box D-516, The Oil and Gas Journal, Tulsa, Oklahoma, stating complete detailed background. All communications confidential.

GEOLOGIST or Petroleum Engineer—For structural and evaluation work with sound independent company in New Orleans. Must have at least two years experience—preferably more. Salary commensurate with ability. Box D-547, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: SEISMOGRAPH PARTY CHIEFS—For field work in Alberta, Canada. Single or married men, no children, preferred. Minimum two years party chief experience required with university geological or geophysical background. Salary open based on experience and general ability. Excellent opportunity for men willing follow field work. Box D-531, The Oil and Gas Journal, Tulsa, Oklahoma.

SECRETARIAL OPPORTUNITY for capable, energetic person, either sex, also interest available, by joining Geologist, experienced operators, incorporating development, producing organization. Postoffice Box 2323, San Antonio, Texas.

MECHANICAL ENGINEER

For oil field service company. Five years mechanical design and development experience on oil field equipment, preferably in gun perforating. Age: under 35. Salary commensurate with experience. Write Box D-544, The Oil and Gas Journal, Tulsa, Oklahoma.

REPRESENTATIVE WANTED

Aggressive manufacturer's representative needed for Houston and Gulf Coast territory for sale of complete line of Oil and Gas Separators and related specialties for production, refining, and chemical industries. Firms having engineering graduate salesmen and no control accounts given preference. Replies should include number and background of sales personnel, territory actively covered, present active accounts. No supply houses or engineering companies need apply. Replies will be held confidential.

Box D-539
The Oil and Gas Journal
Tulsa, Oklahoma

HELP WANTED

QUALIFIED Magnetometer Operator-Party Chief for South America. All expenses for wife and family. Qualified personnel only apply. Exploration Surveys, Inc., 5615 Daniels Ave., Dallas, Texas.

SITUATIONS WANTED

LANDMAN-LAWYER—Over ten years experience East Texas and Gulf Coast. Refer Box D-523, The Oil and Gas Journal, Tulsa, Oklahoma.

EXECUTIVE ACCOUNTANT, CPA Fifteen years diversified accounting and tax experience, principally in Oil Industry. Desires change. Box D-524, The Oil and Gas Journal, Tulsa, Oklahoma.

LAND MAN, 31, Legal Education, Abstract experience, Leased and perfected titles in Texas, Louisiana and Mississippi. Three years with Major Company, desires change, good reason. Go anywhere. Job must have good future. Box D-537, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST. Executive Geologist desires change. Fifteen years' experience over United States and Canada. Unusually competent in planning and supervising major exploration programs. AB and MS degrees in Geology. Now employed. Box D-521, The Oil and Gas Journal, Tulsa, Okla.

BRADFORD man with intimate knowledge of Bradford, Oil City, Pa.; Bolivar, N. Y., Oil Fields also new Renova Gas Field can give expert representation to manufacturers who need sales supervised in these areas. Thoroughly familiar with secondary recovery problems and equipment sales. Can sell direct or push thru Supply Companies. Exceptional opportunity. Reply Box D-533, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 131, Ph. No. 131, Hobbs, New Mexico.

GRADUATE Petroleum Engineer, two years experience with major company, desires connection with independent in West Texas area. Box D-548, The Oil and Gas Journal, Tulsa, Oklahoma.

PROGRESSIVE PLANT MANAGER for grease and lube oil plant. Fifteen years managerial experience—production control, product development, inventory control, purchasing, costing, personnel, traffic. Salary commensurate with position. Box D-542, The Oil and Gas Journal, Tulsa, Oklahoma.

DRILLING AND PRODUCTION supervisor: Desires position with an Independent. Eight years with major company. Experience in Drilling and Production in Texas, Louisiana, and Mississippi. B.S. in P.E., Age 32, family. Box D-545, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED IN EAST TEXAS field, preferably near Kilgore or Overton, work supervising and producing lease or number of leases. Will do all flowing or pumping on per-well or percentage basis. Can furnish own manpower and car. If interested, contact Box D-546, The Oil and Gas Journal, Tulsa, Oklahoma.

RECENT GRADUATE GEOLOGIST seeking permanent position. Experienced in oil fields. Anything considered. R. P. Smith, 1206 South Baltimore, Tulsa, Okla., Phone 4-9311.

SERVICES

PETROLEUM INDUSTRY TAX AND COURT SERVICE
Covers current developments in Federal taxes and all state and Federal court decisions affecting the industry. Issued twice a month. Subscription—$7.50 per year. P. O. Box 447, Houston 1, Texas.

Let us help you locate your oil wells. Our scientifically instrumentation survey will show you where there is oil, outline complete pools, number of pays, etc. Most positive results; let us prove it to you. Don't waste your money on dry holes. Our services are reasonable. Breuer Bros., Sheridan, Ill.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ANADARKO BASIN ROYALTIES
Favorably located on trend in Roger Mills Co., Oklahoma, and Roberts Co., Texas, at attractive prices. E. E. Reynolds, Herring Hotel, Amarillo, Texas.

CHOICE NO. DAKOTA MINERALS
FOR SALE: 10,000 acres of perpetual minerals in North Dakota under major companies leases paying yearly rentals. $3.00 per acre. Can sell in 200 acre blocks. Navarro Royalties Company, P. O. Box 2626, Odessa, Texas.

FEE OWNER of several thousand acres mineral title near present production. Favorable Geology. Will sell ¼ royalty interest in total acreage for sufficient to develop and agree to return the funds from first production. Box D-519, The Oil and Gas Journal, Tulsa, Oklahoma.

MONTANA ROYALTIES
Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1228 Great Falls, Montana.

FOR ROYALTIES in Coke, Runnels and Tom Green Counties, Texas, Contact: Joe Carter, Box 371, Phone 166 or 68, Bronte, Texas.

LEASE AND DRILLING BLOCKS

HAVE proven location for shallow oil. Need few investors with $100.00 to join in drilling. Quick action. Box D-535, The Oil and Gas Journal, Tulsa, Okla.

LEASES ROYALTIES

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Bought and Sold—Any Area
Inquiries Invited

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6376 Clayton Road, St. Louis 17, Mo.

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One 800 acre block along West side of White River; Knox County, Indiana; 4 North; 8 West. No. 2 block: 454 acres in Daviess County, Indiana; 4 North; 7 West. Must have Salem Test. This acreage all lies Southwest of the Plainville Pool, Daviess County, Indiana.

LEO H. GRAVES
Phone 64, Farina, Ill.

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Bismarck, North Dakota

(Member National Oil Scouts and Landmen Association. References exchanged).

LEASE AND DRILLING BLOCKS

OFFERING 30,000 acres leases Valencia County, N. Mex., 10,000 Hidalgo County, 6,000 Torrance County, $1.50 acre—17,000 acres Wallace County, Kansas, $1. Write if interested, Box 2153, Denver, Colo.

IF you've got real oil proposition or royalty that you wish to sell, or any defaulted municipal or special assessment bonds, bring your deal to me. Dyer-OJ, 1835 Champa, Denver, Colorado.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W P. Harley, Bowling Green, Kentucky

OFFERING 32000 10 yr. oil and gas fee leases at $1.25 per acre in Western Nebraska County where oil play is hot right now. Box 2181, Denver, Colo.

COLORADO Land in Lincoln Co.: 10,000 acres improved Ranch, consider Oil lease $1 acre or will sell $16 acre. Surface Niobrara, springs and well water, heavily grassed, ½ suitable for wheat; E. H. Grantham, Ordway, Colo.

WOULD offer 2,000 acres in oil and gas area, Montcalm County, Michigan, for a well or will contribute for an interest. Good geology; exchange references. Box D-521, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED immediately: fee land; producing, non-producing leases, royalties; Texas, New Mexico, Oklahoma, Arkansas, Louisiana. Give price; description. American Oil Co., Dept. OJ, Postoffice Box 38, Houston.

CUBA: MOST PROMISING OIL LANDS—Large areas, good geology. Reasonable royalty, rental or outright sales. No production curtailment. Ready high price market, unlimited demand. Refinery available. Holding in Pinar del Rio, Havana, Matanzas and Santa Clara Provinces on most favorable structures known. Maps and information available. Cuban Oil Enterprises. Aguiar 574 St. Havana, Cuba.

TENNESSEE ACREAGE
LEASES AVAILABLE FOR DEVELOPMENT—Several thousand acres with extremely interesting unrecorded geological structures and seepages. Adjacent to land leased by major oil companies. Write: E. A. Munyan, Box 572, Oak Ridge, Tenn.

FOR SALE—MAPS

STRUCTURAL and geologic map with geologic report covering the entire San Juan Basin in northwest New Mexico and southwest Colorado. Covers 15,000 square miles, contours on Dakota sandstone from latest information. Map-scale one-quarter inch to mile, 36 by 42 inches, original and copyrighted. Box D-541, The Oil and Gas Journal, Tulsa, Oklahoma.

BUSINESS OPPORTUNITIES

WANT about $5,000 for small refinery deal in Montana. Abnormal returns from investment. Details — Box 2181, Denver, Colo.

FOR SALE: Complete oil well cementing equipment and business. Owner retiring due to poor health. Box D-504, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

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Executive Transport

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Purchased new by corporation which is replacing with larger ship. N.C. 44641. License expires 4/21/51. Pratt and Whitney Wasp Jr. Engines, Model R-985, only 332 hours since P. & W. factory overhaul and new hydromatic propellors. Complete radio equipment including I.L.S. All C.A.A. bulletins have been complied with. Like new.

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Minneapolis, Minnesota

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WANTED: SURPLUS Chemicals, Oils, Waxes, Solvents, Wastes and Residues of all kinds. Chemical Service Corporation, 98-06 Beaver St., New York 5, N. Y.

LEASES AND RENTALS

FOR lease or rent 3030 square feet attractive office space in Frates Building, Odessa, Texas. Modern, air-conditioned and parking space. On lease basis, will arrange floor space to suit tenant. C. L. Frates, 1101 First National Building, Phone 2-6301, Oklahoma City, Oklahoma.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa, 3, Oklahoma.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorney, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

PRODUCTION WANTED

WE ARE INTERESTED in purchasing marginal or semi-marginal production in Permian Basin for Cash or terms. Please send complete details to Box D-543, The Oil and Gas Journal, Tulsa, Oklahoma.

EQUIPMENT MEN

(Continued from page 179)

Edgar Elected Hunt-Spiller Vice President

A. J. Edgar, general manager of Hunt-Spiller Manufacturing Corp., Boston, producers of oil-industry castings, has been elected a vice president, Neil C. Raymond, president, announced.

National Supply Opens Stores in Canada, Kansas

National Supply Co., Ltd., has announced the opening of a new store at Stettler, Alta., Canada, and National Supply Co. has announced a new store at Great Bend, Kans.

The Stettler store will service the area surrounding Stettler and particularly Stettler field. It is under the direct supervision of R. Wesley Burns, manager of National Supply's Canadian division. D. O. Fairbairn, formerly sales representative at Edmonton, Alta., will manage the store and D. K. Eastcott will be field representative.

The Great Bend store is under the supervision of C. S. Miller, assistant district manager for western Kansas. F. E. Horton, formerly a field salesman at Chase, Kans., will manage the store and the field salesman is C. C. Gill, who was transferred from Pratt. In addition to this personnel, National Supply will have, at Great Bend, a production equipment salesman, a sales engineer for rotary equipment, and a service man.

Continental Makes Four New Store Appointments

Continental Supply Co. has announced the transfer of one store manager and the appointment of three new store managers.

H. B. Harris is now manager of the Continental store at McAllen, Tex., being transferred to this point from Nacona, Tex., where he served in the same capacity. D. D. Tidrow succeeds Harris as Continental's Nacona store manager. He formerly served at Wichita Falls.

C. D. Conklin has been appointed manager of the Continental branch at Casper, Wyo., having previously served as salesman at that point, and E. V. Frames has been appointed manager of the Houma, La., store. Frames was formerly field salesman at Houma.

FWD Announces Promotions Of Pernot and Thompson

Robert A. Olen, general manager of Four Wheel Drive Auto Co., has announced the appointment of Lloyd Pernot as manager of national accounts and the appointment of John Thompson, formerly specialized markets manager, as director of the service division, Pernot's former position.

Pernot has been with FWD since 1931 and has been in the service division for 17 years. He was appointed service director in 1938.

A trained engineer, Thompson joined the FWD organization in 1947 after 20 years of engineering and management experience with R.C.A. and Western Electric Co. At FWD he has served as assistant advertising and sales promotion manager and as manager of specialized markets.

Oklahoma Fields

(Continued from page 169)

erboard 6,288 ft., Oswego 6,640 ft., Woodford 7,742 ft., Hunton 7,790 ft.

Lincoln County: Kingery Drilling Co. 1 Lafferty, SW SW NE 9-15n-2e, elev. 1,054 ft., dry, TD 5,022 ft., Pawhuska 1,735 ft., Avant 2,976 ft., Hogshooter 3,561 ft., Layton 3,598 ft., Checkerboard 3,850 ft., Cleveland 3,892 ft., Big lime 4,297 ft., Oswego 4,375 ft., Prue 4,515 ft., Verdigris 4,552 ft., Skinner 4,600 ft., Bartlesville 4,780 ft., Mississippi lime 4,905 ft., Woodford 4,950 ft., Hunton 5,015 ft.

Osage County: Norbla Oil Co. 1 Osage, SE SW NW 5-22n-8e, elev. 1,061 ft., dry, TD 3,110 ft., Layton 1,358 ft., Hogshooter 1,608 ft., Layton 1,622 ft., Checkerboard 1,898 ft., Big lime 2,103 ft., Oswego 2,257 ft., Prue 2,347 ft., Skinner 2,435 ft., Mississippian 2,722 ft., Misener 2,930 ft., Arbuckle 3,079 ft.

Norbla Oil Co. 2 Osage, NE SE NW 11-24n-6e, elev., 958 ft., dry, TD 2,811 ft., upper Layton 1,828 ft., Hogshooter 1,943 ft., lower Layton 1,959 ft., Checkerboard 2,190 ft., Big lime 2,339 ft., Oswego 2,473 ft., Skinner 2,629 ft.

Pontotoc County: Jones-Shelburne 1 Drake, NE NE NW 29-5n-4e, elev. 1,091 ft., dry, TD 2,552 ft. in Wilcox, Pennsylvanian 2,420 ft., Viola 2,490 ft.

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CALENDAR OF EVENTS

June

American Society of Mechanical Engineers, Hotel Statler, St. Louis, June 19-23.

Canadian Gas Association, annual convention, Manoir Richelieu Hotel, Murray Bay, Quebec, June 19-24.

Kentucky Oil and Gas Association, annual meeting, Lexington, Ky., June 22-23.

Petroleum Equipment Suppliers Association, annual membership meeting, Greenbrier Hotel, White Sulphur Springs, W. Va., June 25-27.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 26-30.

American Petroleum Institute, midyear division of production and standardization conference, Brown Palace Hotel, Denver, June 26-30.

July

Institute of Petroleum, oil shale and cannel coal conference, Glasgow, Scotland, July 3-7.

Pacific Coast Gas Association; annual convention, Seattle, Wash., July 31-August 3.

August

Interstate Oil Compact Commission, summer meeting, French Lick, Ind., August 3-5.

September

National Chemical Exposition, Chicago Coliseum, Chicago, September 5-9.

American Institute of Chemical Engineers, regional meeting, Minneapolis, September 10-13.

American Society of Mechanical Engineers, and Instrument Society of America, Municipal Auditorium, Buffalo, N. Y., September 11-15.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 13-15.

Instrument Society of America, annual instrument conference and exhibit, Municipal Auditorium, Buffalo, N. Y., September 18-22.

American Society of Mechanical Engineers, petroleum mechanical engineering conference, Roosevelt Hotel, New Orleans, September 24-28.

October

American Gas Association, annual convention, Atlantic City, N. J., October 2-6.

Mid-Continent Oil and Gas Association, Texas division, Dallas, October 4-5.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, Mid-Continent meeting, Roosevelt Hotel, New Orleans, October 4-6.

American Association of Oilwell Drilling Contractors, annual meeting, Mayo Hotel, Tulsa, October 12-13.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, West Coast meeting, Elks Club, Los Angeles, October 12-13.

Permian Basin Oil Show, Odessa, Tex., October 19-22.

November

Mid-Continent Oil and Gas Association, Louisiana-Arkansas Division, annual meeting, Roosevelt Hotel, New Orleans, November 2-3.

American Petroleum Institute, annual meeting, Biltmore and Ambassador Hotels, Los Angeles, November 13-16.

American Society of Mechanical Engineers, Hotel Statler, New York, November 26-December 1.

December

American Institute of Chemical Engineers, annual meeting, Columbus, Ohio, December 3-6.

NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month. Ye Olde College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club.

New York Nomads: June 27, golf party, Ardsley (N. Y.) Country Club.

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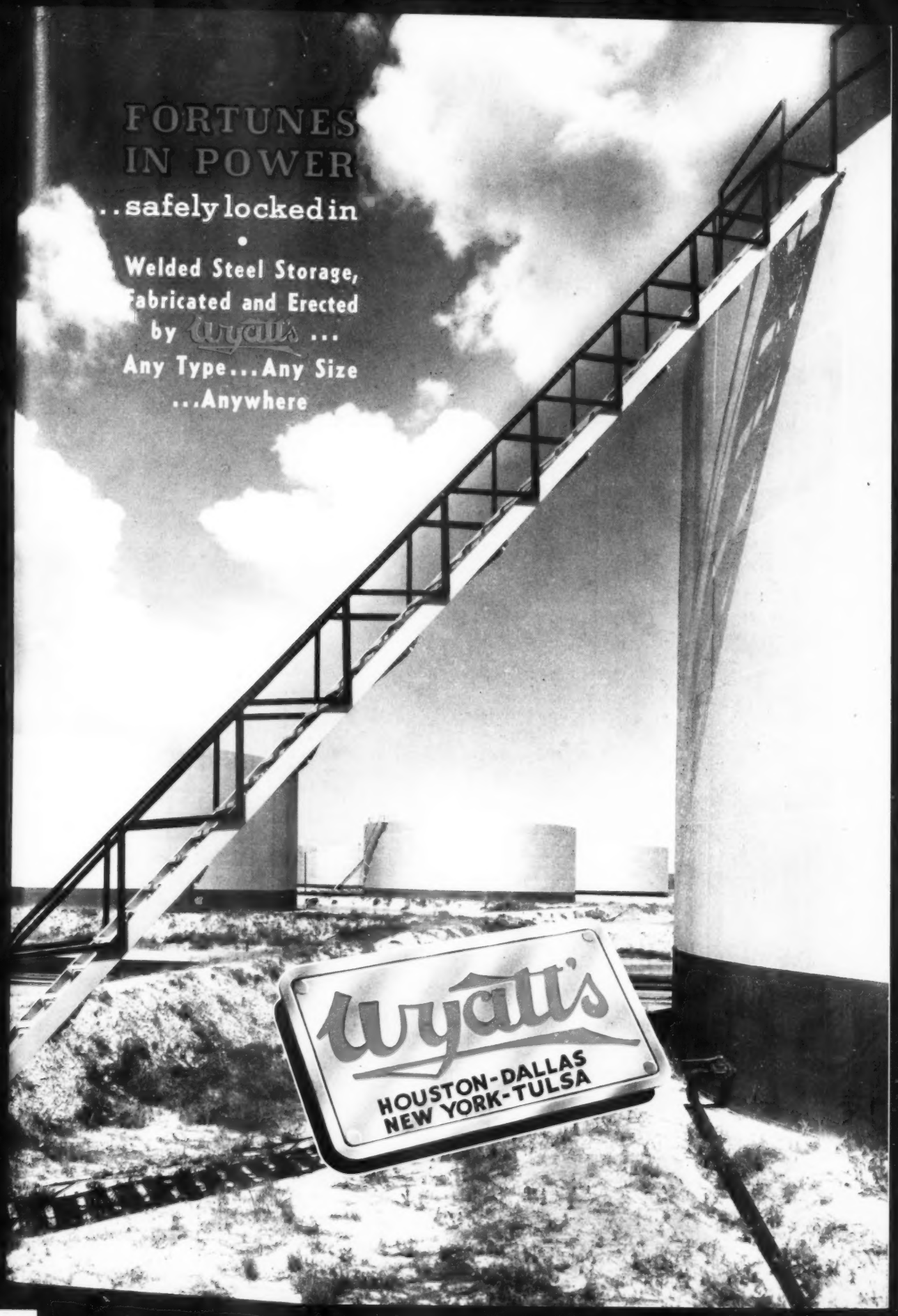
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